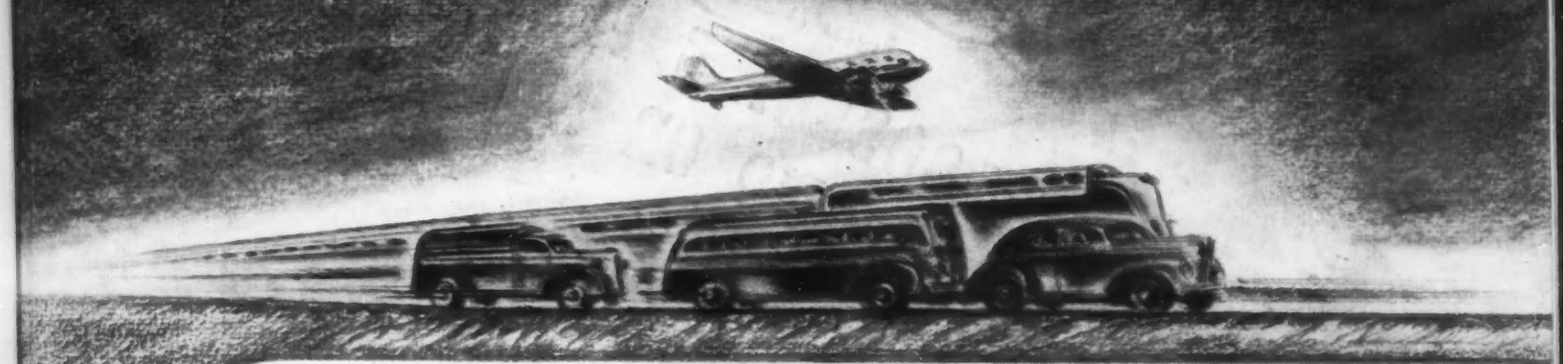
S·A·E Journal



NOVEMBER 1940

SOCIETY OF AUTOMOTIVE ENGINEERS

Speed Nut System

REPLACES THREADED NUT AND LOCK WASHER

Speed Nuts

PREVENT LOOSENING FROM VIBRATION
REPLACE TWO OR MORE PARTS

CUT ASSEMBLY COSTS IN *half*

AND PROVIDE A BETTER ASSEMBLED PRODUCT

The SPEED NUT is a spring steel, heat treated fastening device that performs additional functions not possible with the threaded nut and lock washer combination.

The SPEED NUT starts on the bolt threads instantly, and as the bolt or screw is tightened, the main arch of the SPEED NUT IS BROUGHT DOWN AND THE PRONGS ARE FORCED DEEPER into the roots of the threads. This combination of an arched spring lock and an inward thread lock holds assembled parts together, for the life of the product, by conquering vibration loosening. And what's more, it lowers your net assembly costs.

Check every assembly location and switch to Standard SPEED NUTS wherever possible. We invite you to take the first step by writing for samples and explaining nature of your assembly.

TINNERMAN PRODUCTS, INC., 2063 FULTON ROAD, CLEVELAND, OHIO

Manufacturers of Patented Speed Nuts

IN CANADA: Wallace Barnes Co., Ltd., Hamilton, Ontario IN ENGLAND: Simmonds Aerocessories, Ltd., London IN FRANCE: Aerocessoires Simmonds, S. A., Pa

OVER 900 MILLION ALREADY USED—OVER 700 SHAPES AND SIZES

S·A·E Journal

Published Monthly by The Society of Automotive Engineers, Inc.

Arthur Nutt, President — David Beecroft, Treasurer

John A. C. Warner, Secretary and General Manager

Norman G. Shidle, Executive Editor

About Authors

■ *Many days of constant personal contact with leading automotive engineering executives and designers in Detroit, reams of correspondence, and weeks of careful study and analysis of passenger-car specifications, have been the immediate background of* T. A. BISSELL'S *(M '37) paper "1941 Car Design Trends." Mr. Bissell, who has been technical editor of the SAE Journal since 1935, received his M.E. from Cornell in 1923. He had eight years of plant, production, and sales engineering experience before he began his editorial career on the staff of "Maintenance Engineering," a McGraw-Hill publication. Since then he has been doing technical editorial work. He is co-author of the article on motor cars in the new edition of the Encyclopaedia Britannica.*

■ LYMAN C. FISHER *since June of this year has been in charge of the extensive research program on seat cushions and riding comfort which is being undertaken by the Murray Corp. of America. He had previously been a member of the research faculty at the University of Michigan, from which he had received his Bachelor of Science and Master of Science degrees in 1932 and 1933 respectively. He is now a candidate for the degree of Doctor of Science. Before joining the U. of M. faculty in 1936, Mr. Fisher was employed by the Bull Dog Electric Products Co. as design engineer, evolving several designs which have matured into patents.*

■ K. R. JACKMAN *was born in Sadeya, Assam, India, attended English and American schools, and studied engineering at New York University. He was graduated in 1929 with his B.S. in M. E. Degree, and obtained his Masters' Degree two years later. He has been stress analyst, draftsman, and/or test engineer with Loening Aeronautical, V. E. Clark Aircraft Corp., Hall Aluminum Aircraft Corp. and, since 1931, with Consolidated Aircraft Corp. With*

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TRANSACTIONS SECTION

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29 West 39th St., New York, N. Y.

A. J. Underwood, *Western Advertising Manager*,
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An ANNOUNCEMENT

GENERAL MOTORS recognizes the present emergency. It realizes its duty to the nation to advance in every way within its power the program of National Defense. It has already assumed most important obligations. But in addition General Motors believes that industry today has a second responsibility—one of vital consequence. American defense demands first call on those products of industry, both as to scope and volume, which are essential to protecting the nation against aggression. It also demands, even though the fact be less generally recognized, a sound and virile economy. One is the complement of the other. A sound economy is essential to the objectives of the defense program.

In line with its conception of this dual responsibility, General Motors presents at this time its 1941 offerings of motor cars. It has combined with the important responsibilities it has assumed under the defense program its normal responsibilities incident to our peacetime economy. The new line of motor cars is now on display before the critical judgment of the public at the Automobile Shows and in General Motors dealer showrooms in every community throughout the land.

It has always been the policy of General Motors to build into its products the greatest possible measure of value. It has created an engineering group which, from the very beginning of the industry, has made far-reaching contributions to technical progress. It has contributed importantly to the motor car's becoming the serviceable mechanism of today. From the electric self-starter in the early days down through the years, one engineering achievement has followed another. And in great variety: tilt-beam headlights, Duco lacquer finishes, crankcase ventilation, syncro-mesh transmission, Fisher No Draft Ventilation, Knee-Action wheels, Turret Top, automatic transmissions and steering column gearshift.

But that is not all! General Motors technicians have demonstrated their versatility by developing such engineering products as the Diesel locomotive, destined to revolutionize transportation by rail. The Allison engine—an outstanding development in aviation engine practice and now coming into mass production—is making a contribution to one highly technical phase of the problem of National Defense. And in an allied field, tetra-ethyl lead as a component of gasoline has revolutionized the relationship of the fuel to the engine, producing more power with less weight and with greater efficiency. As a result, not an airplane leaves the ground today without in effect reflecting tribute to the technical capacity of General Motors. We are proud of this record of accomplishment. It is the accumulated experience of such an engineering group that has been built into the General Motors 1941 models.

In the different lines of motor cars com-

prising the General Motors offerings, there will be found countless refinements and innovations—some in some cars, some in others, but reflected to an important degree in all:

A technical improvement of importance is a new fuel system—Compound Carburetion. It is an innovation in motor car engineering practice. To the regular carburetion system is added a second, or supplemental, carburetor which can come into action when the driver requires additional performance. In effect, but not in principle, it is like the supercharger. The engineering benefits resulting from this achievement take the form of added performance and increased fuel economy. This is exemplified in Buick.

A safety feature worthy of note, based upon the Unisteel Turret Top body introduced by General Motors some years ago, consists of all doors being swung from the front. Thus they open against the windstream of a car in motion. This tends to eliminate the hazard of doors swinging open if accidentally unlatched. The same feature provides greater convenience for front and rear door passengers alighting from the car at the same time.

A year ago General Motors announced a new mechanism to connect the axle with the engine—the Hydra-Matic drive. You simply steer! The clutch is entirely eliminated. That is a most important feature. The changes in gear ratio or speeds are automatic. This device is designed to take the transmission out of driving technique. And it does! This has been exemplified in Oldsmobile. The outstanding acceptance of this Hydra-Matic drive as evidenced by the testimony of many thousands of enthusiastic users has had a stimulating effect in accelerating the industry's progress in this important field. Thus progress broadened. In a more highly refined and somewhat simplified form the Hydra-Matic drive will be continued in the 1941 line. You certainly will be intrigued when you see and try this interesting mechanism.

But the modern motor car has become more than something in which to go from place to place. For many it is something to live with. Hence more comfort, more luxury of appointment and increased roominess characterize the new designs. General Motors 1941 cars are larger. The seats are wider. Thus there is more room for both passengers and baggage. The concealment of running boards inside the body is another innovation. The appointments are more luxurious. These should be important considerations in determining the motor car you will drive in 1941.

Nor is that all! The "Torpedo" type—the body sensation of 1940—has been continued with even greater appeal. And there has been added another body creation — the aerodynamic type. Everyone should see and try it!

General Motors hopes that when you have seen and become acquainted with these 1941 motor cars you will be as enthusiastic about them as we are. And that you will get as great a thrill out of their interesting features, their performance, attractiveness, serviceability and utility as we have in their creation and in presenting them to you at this time.

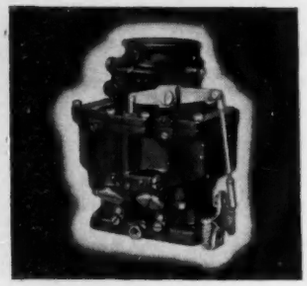
GM
GENERAL MOTORS

Alfred P. Sloan, Jr.
Chairman
GENERAL MOTORS CORPORATION

CHEVROLET • PONTIAC • OLDSMOBILE • BUICK • CADILLAC

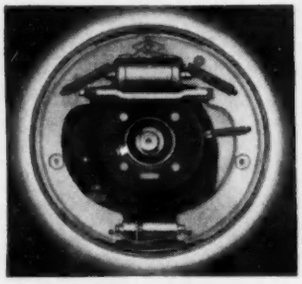
FOR YOUR 1941 CARS AND TRUCKS—

This simple fact has greater meaning than ever before!



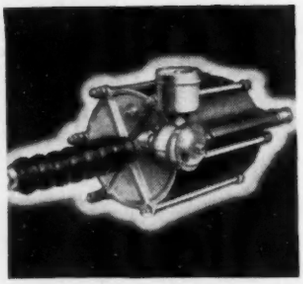
Stromberg Carburetor

Pioneer of progress in carburetion—outstanding for its high efficiency, its many superiorities, its long life, its simple and sturdy construction and its stability of adjustment.



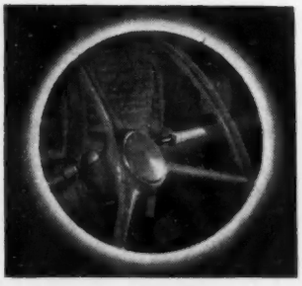
Bendix Brakes

Smoothest, simplest, most stable in adjustment, easiest to adjust. Embodies exclusive principles which assure better braking with less pedal effort and lower maintenance expense.



Bendix B-K Power Braking

Overwhelming favorite, with every advantage of reliability, performance, long life. Only system providing everything Power Braking can offer. Millions in use the world over.



Bendix Gear Control

Pioneer of finger-tip gearshifts and most highly developed of steering-post gear controls—least manual effort needed—utmost responsiveness provided. Years of service.

WHAT BENDIX BUILDS IS WELL BUILT

THIS year 1941, in the automotive industry, might well be called "the year of smaller, but greater, differences."

Everywhere you hear folks remark: "I have a hard time telling the new cars apart!"

And that's to be expected. They're *all* streamlined, *all* sleek and impressively long-looking, *all* swift and silent and easy-riding.

The differences have grown smaller . . . and, paradoxical as the statement may seem, these smaller differences have become more important than ever.

The individual *reputation* of each unit in the cars and trucks you build and sell and service, becomes something more and more worth talking about. And of all the chassis components there are none more vital to performance, economy, safety, handling ease, than those of Bendix manufacture.

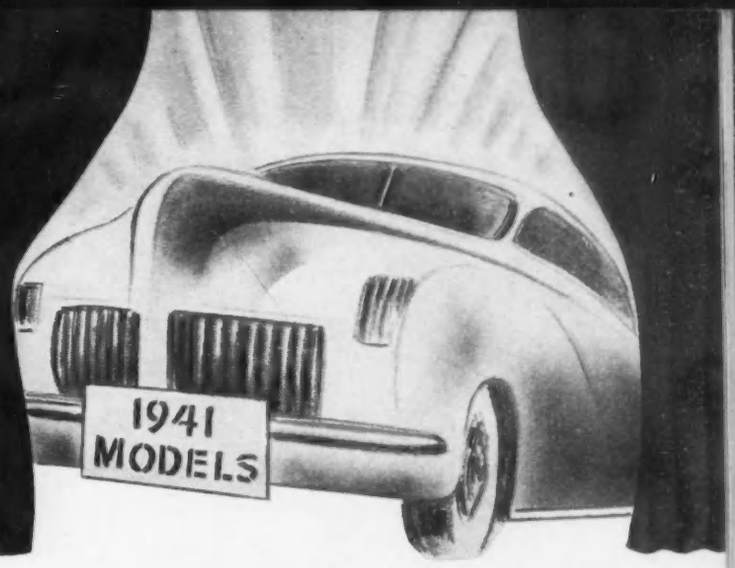
The public KNOWS that "What Bendix Builds Is Well Built." A brake, a carburetor, a gearshift, universal joint or Power Braking System that is Bendix-built can swing a sale today as never before. When a manufacturer engineers such a unit into his car or truck, he provides a sales asset as well as performance-assurance.

BENDIX PRODUCTS DIVISION
OF BENDIX AVIATION CORPORATION
SOUTH BEND, INDIANA

In Canada: Bendix-Eclipse of Canada, Ltd., Windsor, Ont.

BENDIX *Products*

SAE ANNUAL DINNER *High Spot* OF N.Y. AUTOMOBILE SHOW WEEK



GLOWING bright against the brilliant background of the 41st National Automobile Show and its display of 1941 automobile models, the SAE Annual Dinner brought interest in national defense progress to a peak for more than 1000 members and guests at the Hotel Commodore in New York on Oct. 14.

Speakers, speeches, and entertainment – all reflected the Society's purposeful participation in United States' current preparedness drive.

A timely address by Hon. Robert P. Patterson, Assistant Secretary of War – a memorable talk by SAE Presidential-nominee, A. T. Colwell – able discussion by K. T. Keller, toastmaster, a brief message from SAE President Arthur Nutt – and stirring music by Capt. Francis Sutherland's 7th Regiment Band combined to make the meeting a brilliant success.

Assistant Secretary of War Patterson, speaker of the evening, disclosed the broad scope of the War department's motorization plan with the revealing statement – "We contemplate the procurement of sufficient numbers of vehicles to equip a field force of 1,400,000 men, with a modest amount of equipment in reserve."

■ K. T. Keller Praises SAE

Chrysler Corp. President K. T. Keller, toastmaster, in crystallizing the attitude of the Society toward national defense, stated, "We, of the SAE, who deal primarily with peacetime developments, naturally have many ideas of what our Army and Navy should have. . . . Now that vast quantities of mechanical devices are required for defense, we will find rapid strides in the designing and building of these devices."

Striking out from this base, Mr. Keller outlined a course for the closer coordination of the SAE and the U. S. defense groups.

"To me," Mr. Keller said, "the tapping of this great potential reservoir of the SAE can be best accomplished by the SAE's top representatives in Washington, who, knowing the trend of the Army and Navy requirements, and being acquainted with the membership of the SAE, can direct the activities of the SAE members to the best assistance of our Armed Forces."

Mr. Keller paid tribute to the SAE as a "vast storehouse of knowledge that can and should be of great assistance to our Army and Navy. Your prompt acceleration of your activities and interests along defense lines during the current year," he told the SAE members, "confirms the patriotic feeling of the membership of the SAE."

Mr. Keller also traced the striking speed with which the Society has rallied to the standard of national defense in the present emergency, pointing out that: "Ever since President Roosevelt made his preparedness speech on May 26, 1940, SAE cooperation with military and governmental forces has been on the up-grade."

■ Colwell Pledges SAE Aid

SAE Presidential-nominee A. T. Colwell, vice president, Thompson Products, Inc., proclaimed the breadth and strength of the SAE's contribution to human welfare, pointing to its coverage of "all fields of automotive endeavor – the very essentials of war today."

"The world scene is changing rapidly," he stated, "and we cannot say what the next year holds in store. . . . We know that the art of war today is highly technical, based upon the ability to move large bodies of troops quickly to strike with devastating power. Mechanization upon the ground, and the sky full of planes is the latest phase of warfare. We might truthfully say that present war is centered about the internal combustion engine, so important a part does that engine now play. . . . And the SAE is headquarters for equipment propelled by internal combustion engines."

Concluding, Mr. Colwell pledged the SAE membership to stand ready to do its utmost, as free men in this democracy will always do, to "help build, both in quality and in quantity, the mechanized ground equipment and air equipment necessary to the safety of this land."

SAE President Arthur Nutt conducted a brief business session at the opening of which he said: "With the national defense activity of the Society growing so rapidly, I urge you to encourage automotive engineers who are not already members of the SAE to become members so they can actively participate through the Society in strengthening America's defenses."

See page 445

"Trends in 1941 Car Design"

by Thomas A. Bissell
Technical Editor, SAE Journal

See page 445

MOTORIZATION POLICY of the

Hon. Robert P. Patterson
Assistant Secretary of War

(From an address at the SAE Annual Dinner, Oct. 14, 1940)

OUR Army has been gas-engine conscious since long before the World War. Its motorization policy is now crystallized and focused in the light of recent events, but is still pliant and flexible – there is room in it for the adoption of new ideas once these have been proved in practice, and there is room as well for experimentation to test the proving. It is now possible for me to present to you – and no audience is more deserving of hearing it – an outline of what our motorization policy is.

A fundamental point in that policy is the use of motor equipment as manufactured by the automotive industry with the fewest modifications consistent with securing vehicles of required sturdiness and cross-country mobility.

The Department's plans visualize that all tactical transportation shall be of the all-wheel drive type and contemplate the procurement of sufficient numbers of vehicles to equip a field force of 1,400,000 men, with a modest amount of equipment in reserve.

All animal-drawn transportation is being replaced so far as practicable with motorized equipment. This does not mean that the death knell of the horse has been sounded, or of the army mule either. But of the 27 divisions in the continental United States, 25 now rely entirely on motor transport for tactical operation and supply. The field trains of our cavalry divisions have been motorized. And as a final indignity to the horse, our cavalry reconnaissance regiments are partially motorized and are equipped with motor trailers for the transportation of their horse elements.

■ Army Requires 186,000 Vehicles

One hundred and eighty-six thousand vehicles will be required to carry out our motorization policy. Of these, 16,000 have been purchased from 1940 funds, and 39,000 will be delivered before January 15. Funds for the remainder are already appropriated or are before Congress.

Here are the problems we must solve if we are to put into effect an ideal motorization policy of national defense.

We are faced with an inevitable conflict between the employment of existing facilities, standard assemblies and the like, and the advisability of designing and building ideal military automotive transportation.

Advances in the automotive industry are so rapid that it has been difficult for the War Department to measure the merits of different types of transportation in the light of their military practicability. We have so far as possible standardized our conception of commercial types with a view to their military adaptability, favoring the ½-ton, 1½-ton, 2½-ton, 4-ton and 6-ton chassis. We are rigidly holding to these limitations on all tactical transportation.

These problems are by no means insurmountable. I put them as something for you gentlemen to think about. Against them there is a vast amount on the credit side. Two advisory committees of the Society of Automotive Engineers, the one cooperating with the Ordnance Department in the study of problems connected with the Army's mechanization program, the other with the Quartermaster Corps in the field of motorization, have rendered distinguished service and deserve well of the republic. Here is a single instance of how effectively this cooperative spirit can be translated into practicality:

The question of the interchangeability of parts is one that might seem to have been created to bedevil an Army. The Quartermaster General tells me that with the assistance of your Advisory Committee, the following reductions in interchangeability have been effected:

Gas-tank patterns have been reduced from eight types to three; instrument board fittings, spark plugs, and generators, from eight to two; coils, condensers, and speedometers from six to one; fan belts from twenty-one to three; batteries from twenty-nine sizes to one; door handles from eight to one.

1940 — 1941

SAE President Arthur Nutt chats with A. T. Colwell, who has been nominated to succeed him as president of the Society for 1941

ARMY

Hon. Robert P. Patterson, Assistant Secretary of War, with Toastmaster K. T. Keller, Chrysler president, who introduced him as speaker of the evening

Preparedness was the dominant theme at your Thirty-Fifth Anniversary Meeting. Your National Defense Committee is performing a splendid and intelligent service at a time when that service can count most. For more than a generation – from the distant day when Lt.-Gen. Nelson A. Miles, veteran of the Civil War and the Indian campaigns, weighed the advisability of establishing an "automobile corps" – your inventive genius, your technical skill, your creative vision, your alert cooperativeness, your fine patriotism have been at the disposal of your country.

The terms "automotive" and "motorized" have developed a broader application since the day your society was organized. A four-engined bomber is as much a piece of automotive equipment as is a sport coupé or a Quartermaster truck. You have given the Army sterling cooperation, and are continuing to give it, in the vital department of the standardization of aircraft and aircraft-engine parts. Your Research Division is working actively with governmental and military groups in the study of aircraft fuel and lubrication problems.

All your researches, reduced to their simplest terms, must invariably be based on the rudimentary tactical and strategic consideration of mobility. An Army moves. To win battles, it must go somewhere; to prevent an enemy from winning battles it must keep him from going somewhere – immobilize him.

A commander must not only move troops; he must move them to some purpose, unlike that King of France who marched twenty thousand men up the hill and then marched them down again, although this may have been a mere hardening process. He must move them in the direction and at the rate of speed he wishes to move them. A routed army is mobile enough, but the direction and rate of speed are beyond the control of the commander. Mobility, therefore, is nothing unless it be accompanied by maneuverability – the dual technique of which Stonewall Jackson was a great master. Another Confederate officer, Gen. Nathan B. Forrest, gave the best definition of maneuverability: "To git thar fustest with the mostest men."

The most elementary form of military mobility is walking. Hence the infantry. The infantry has been called the great discovery of every war. The crossbow was supposed to relegate the infantryman to the boneyard. It did not. Similar hopes were entertained for the harquebus, the needle-gun, the machine-gun, the airplane, the armored car. The infantry marches on.

Let me quote a German army officer writing in a technical military periodical as recently as August of this year, three months after the savage descent of the panzer divisions on the Low Countries and France:

"The object of all arms is to allow the infantry to reach the enemy while still in possession of sufficient firing and attacking power to bring about a final decision. . . The courage and efficiency of the individual soldier is the decisive factor, regardless of the technique employed. The infantry constitutes the main arm, and is supported by all the other arms, which try to see to it, as far as possible, that the infantry is able to engage in close combat against the enemy with its strength impaired as little as possible. If our aviators and tanks have succeeded during the present war in utilizing this tactical principle to such good advantage in many places that the infantry has often encountered an already crushed foe, this merely proves that our troops of all arms have been properly trained and not that the importance of the infantry's missions has diminished. . . The enemy's last resistance must be broken, as hitherto, by the infantry, and in the last hundred meters of a charge the infantry must accomplish this result unaided and solely by the force of its own weapons."

A Few of the 62 Distinguished Guests at the Annual Dinner Speakers' Table

1. Lt.-Col. Mark V. Brunson, Quartermaster Motor Supply Depot, Fort Wayne; Major-Gen. E. B. Gregory, The Quartermaster General; Lt.-Col. H. J. Lawes, commanding officer, Camp Holabird, Quartermaster Depot; B. B. Bachman, chairman, SAE National Defense Committee; SAE President Arthur Nutt, and Lt.-Col. William B. Johnson, chief, engineering division, Camp Holabird, Quartermaster Depot
2. William L. Batt, Raw Materials Division, The Advisory Commission to the Council of National Defense, with Dr. George W. Lewis, member of the SAE National Defense Committee, who is director of research, National Advisory Committee for Aeronautics
3. Hon. Edward Warner, vice chairman of the Civil Aeronautics Board, and T. P. Wright, chairman of the SAE Aeronautical Standards Board for National Defense and vice president in charge of engineering, Curtiss-Wright Corp.
4. Brig.-Gen. G. M. Barnes, Office of the Chief of Ordnance; Brig.-Gen. Earl McFarland, Assistant to the Chief of Ordnance, and Brig.-Gen. B. O. Lewis, Office of the Chief of Ordnance
5. Major D. G. Lingle, Air Corps, War Department, and Com. A. M. Pride, Navy Department, members of The Aeronautical Board and of the SAE Aeronautical Standards Board for National Defense

NATIONAL TRACTOR Meeting Stresses Power Units in National Defense

IMPORTANCE of the tractor as well as other power equipment to our national defense and security, both directly and indirectly, was brought out in papers presented on the "Five Star" program of the National Tractor Meeting of the Society of Automotive Engineers, held at the Hotel Schroeder in Milwaukee, Sept. 24 and 25. Of deep interest also to the tractor engineers, allied technicians and guests, who registered for a new all-time tractor meeting attendance record of 426, were technical papers on fluid transmission and hydraulic drives, and the motion pictures and slides used by the various speakers to illustrate highlights of their papers.

One of the highlights of the two-day meeting which featured four papers and the annual banquet, was the personal appearance of SAE President Arthur Nutt, Wright Aeronautical Corp., who briefly addressed the annual banquet on Tuesday evening.

The two-day program was arranged by a committee headed by C. G. Krieger, Ethyl Gasoline Corp., assisted by T. L. Swansen, Allis-Chalmers Mfg. Co., Milwaukee, in charge of local arrangements. J. M. Davies, Caterpillar Tractor Co., presided at the opening session Tuesday morning, with Elmer McCormick, John Deere Tractor Co., chairman at the afternoon session. Mr. Davies again presided at the annual banquet Tuesday evening, at which C. E. Frudden, executive engineer, Allis-Chalmers Mfg. Co., was toastmaster, and A. W. S. Herrington, president of the Marmon-Herrington Co., was principal speaker. D. A. Milligan Cleveland Tractor Co., and E. F. Norelius, Allis-Chalmers Mfg. Co., presided at the morning and afternoon sessions, respectively, on Wednesday.

In his paper "The Contribution of Power Farming to National Security" Tuesday morning, Dale Cox, director of public relations, International Harvester Co., discussed some of the contributions power farming has made to national security in the past, and outlined additional contributions which may reasonably be expected under current conditions.

"While power farming in the last 20 years has made an almost immeasurable contribution to our national security, there is an enormous amount that can still be done, should the emergency require it," Mr. Cox said, pointing out that contributions of power farming to our national security today probably would be about the same, historically, as the contributions made by the animal-powered farm machinery in other periods, when the country was engaged in war.

"Power farming today gives our nation the most assured food and fiber supply it has ever known. Never were we farther removed from the specter of famine and want. Should the armed forces and war industries require it, our mechanized farms could release more manpower than in any previous period, without endangering in any way our assured food supply.

"Manufacturers of power farming machinery are ready and prepared today, as they have been at other times when needed, to manufacture actual military supplies in addition to their normal products. The industry of which we are a part is capable of producing for export, if the national policy asks it, sufficient machines to affect materially, food production in other lands," Mr. Cox pointed out.

Mr. Cox further contended that the crawler-type tractor, because of its wide range of vital uses in military operations essential to national defense, is more adaptable to direct military use than any other machine manufactured by the tractor industry.

"Not only is it essential for such military field operations as pulling artillery pieces, but it is of the greatest use in such work as the building of emergency airports, the speedy construction of military roads, the leveling off of airports damaged by bombs, the construction of barracks, cantonments, and other similar projects," he explained, stressing that the increased efficiency of tractors resulting from improved engine design and improved fuels "also is an important factor in this industry's contribution to national security."

Scoring the delays in getting our national defense program underway, Mr. Herrington, banquet speaker, took issue with the political campaign procedure of both presidential candidates, and censured political maneuvers slowing up military defense production.

Mr. Herrington discounted current fears that this country will lose heavily economically in the event that Germany is victorious, pointing out that the United States will be the only major power remaining to aid in the rehabilitation of England, France, and Germany, at the conclusion of the war because of the vast destruction of industrial properties in all of the European countries now engaged in war.

Our foreign trade volume, Mr. Herrington said, is only 4¼% of our national income, a loss that would not seriously affect our national economy if Germany should ignore the United States.

Application of "Fluid Power Transmission" was discussed Tuesday afternoon by N. L. Alison, general manager, hydraulic coupling division, American Blower Co.

Mr. Alison discussed marine couplings, variable speed couplings, scoop control couplings, and traction couplings, explaining the functions in each instance, pointing to the reductions in wear and tear on motors and gears through the more even control possible when fluid power transmission is incorporated.

"Because of its ability to prevent the transmission of torsional vibrations, thus completely divorcing the vibrating system of the engine from that of the gears, shafting, and propeller, the fluid coupling has been an important factor in the development of multiple-engine marine drive," Mr. Alison said. "In this application, the coupling serves the further purpose of preventing the operating characteristics of one engine from interfering with the others, and also permits easy clutching and declutching, while under way, by simply filling or emptying the couplings."

The variable speed coupling, used ex-

(*Concluded on page 25*)

AT TRACTOR MEETING

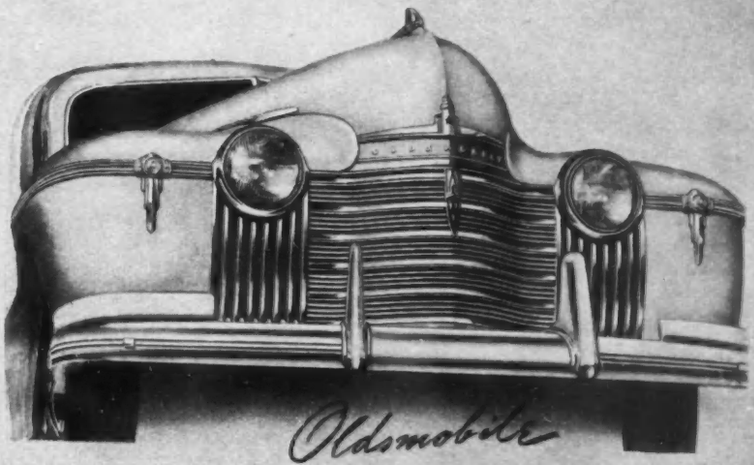

1941 Models
USA 1941
Chevrolet
Buick
Cadillac
Dodge
De Soto
Chrysler

1941 Models

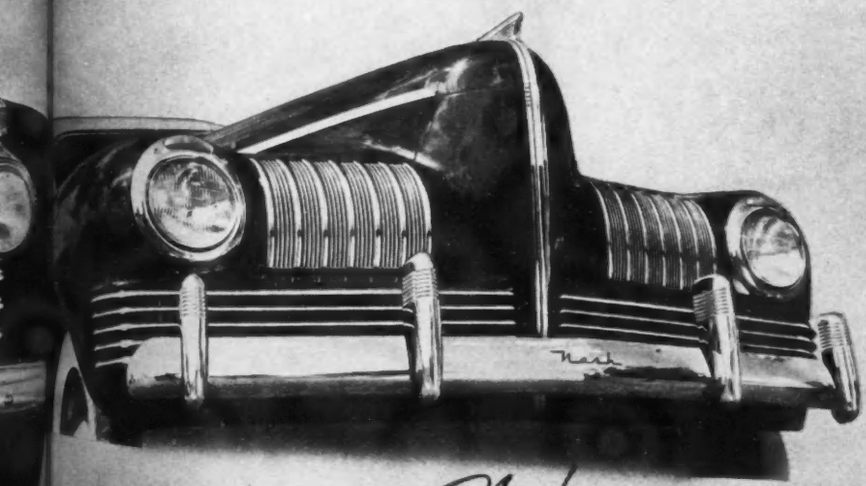
Ford

Mercury

Hudson

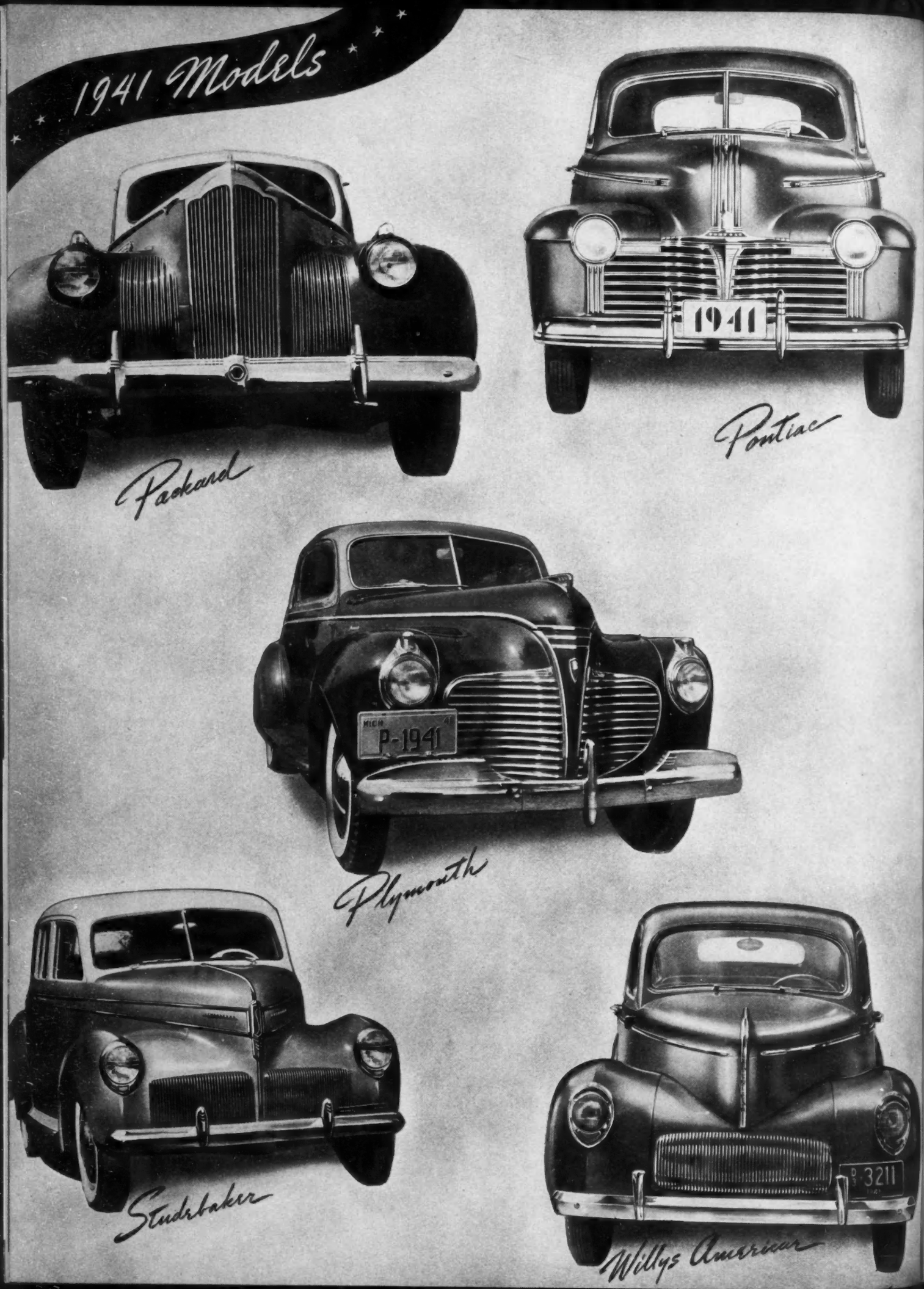


Oldsmobile



Nash

Lincoln-Zephyr


1941 Models
Packard
1941
Pontiac
MICH
P-1941
Plymouth
Studebaker
P-3211
Willys American

National Tractor Meeting

(*Concluded from page 21*)

tensively for the variable speed drive of centrifugal fans, pumps, turbo-blowers, etc., in units up to 2000 hp capacity, and applied to electric motor drives, has also been used in connection with certain diesel-engine applications. It varies from the marine coupling in that it is self-contained, requiring no external stationary housing. Speed regulation is obtained by operating a motor-driven pump in one direction or the other, as it is desired, to increase or decrease the output speed.

"The pump can be controlled from a remote point by means of push buttons, or various types of automatic control can be applied," Mr. Alison said. "The pump operates only when a change of speed is called for and at all other times remains idle, circulation through the oil cooler being maintained by the action of the scoop-tube," he explained.

The scoop control coupling, Mr. Alison said, supplies a convenient means of declutching, provides variable speed for "fishing" operations, and, for instance, when equipped with an oil cooler, permits the slush pumps to remain stalled for extended periods, maintaining pressure on the hole, with the engine continuing to run at reduced speed, when used with diesels driving oil-drilling machinery.

The traction coupling, he said, differs from the first two discussed, in that no provision is made for completely disconnecting the driving from the driven members. Heat generated within the coupling, amounting to about 3% of the power transmitted at normal speed, is dissipated by radiation.

Mr. Alison also mentioned the hydraulic torque converter used extensively for diesel railcar, shunting locomotives, and bus drives.

Discussing applications of fluid couplings, Mr. Alison pointed out that "with all types of transmissions, the fluid coupling has the effect of reducing the amount of gearshifting required and permits the vehicle to be started in a higher gear than is possible with the same transmission not equipped with fluid coupling. This is due to the smoothness with which the load is applied, and also to the fact that the engine operates at all times at or near its maximum torque, regardless of vehicle speed. A further decided advantage is gained from the slip of the coupling, allowing the engine immediately to come up to full speed and exerting the momentum of the flywheel and coupling to accelerate the vehicle," he said.

The discussion following this paper brought out the fact that deterioration of the fluid used will not be serious if sufficient ventilation is provided to take care of the heat generated in operation. It was suggested that nothing but pure mineral oil be used, oil that has a low viscosity, high gravity, and is as thin as possible.

The practical use of fluid power transmission was discussed in the paper, "Hydraulic Drives in Industrial Service" presented by R. M. Schaefer, general manager of the Twin Disc Clutch Co.'s hydraulic department, as part of Tuesday afternoon's program.

The subject of hydraulic drives as treated in this paper concerned the hydraulic clutch and hydraulic torque converter, both of which are dependent upon the hydrokinetic principle for their operation, where power is transmitted by means of the circulatory movement of fluid within the hydraulic chamber of the unit.

"The hydraulic clutch and torque converter are similar in operation to the extent that each is a fluid drive, each will absorb shock loads and torsional vibrations and with the installation of either it is impossible to stall the engine," Mr. Schaefer explained. "On the other hand, there are distinct differences, both in regard to performance and type of installation."

In summarizing the dissimilarities of the two he pointed out that the hydraulic clutch is particularly adapted to installations where only engine torque is to be transmitted, and where the prime mover is operated at a constant speed, as is the case in various generators, pumps, compressors, and marine drives.

"The hydraulic torque converter is adaptable to installations where variable speed operation is required, and where heavy loads are to be accelerated frequently. The increased torque delivered at the low speed is ideal for this purpose. Torque converters are being used very successfully in oil field drilling rigs, logging equipment, cranes and hoists, as well as in locomotives and railcars," he pointed out.

In discussion that followed, Mr. Schaefer explained that converters and couplings both provide excellent brakage, but warned that both of these must be properly cooled. He further explained that converters are especially practical for use with a constant speed electric motor where a variable speed is required. Such usage tends to reduce operating costs, he said.

"If only constant speed is required, there is no need to use a converter, but if a variable speed is required, the use of the converter is practical and advantageous," Mr. Schaefer concluded.

Off-the-Road Haulage

"Heavy Automotive Haulage in Construction and Industry," a paper presented by H. K. Church, Euclid Road Machinery Co., was devoted principally to discussion of off-the-road haulage, with slides showing the various types of machines and typical operations of each. A film "Building the Pennsylvania Turnpike" illustrated a rock excavating highway grading job using equipment produced by Euclid.

In addition to discussing the various types of machinery used in "off-the-road" haulage in construction of dams, levees, harbors, airports, highways, and other public work construction where mass movement of earth, rock, and earth-rock mixtures is necessary, Mr. Church also covered the unit cost of haulage, which he illustrated with slides; the hourly cost of ownership and operation, also using slides; factors controlling output of machines; and the future of heavy automotive haulage.

Use of fluid couplings in this type machinery was favored in the discussion that followed this presentation. It was brought out that the use of these couplings would make possible a reduction in the number of transmission speeds; allow the starting of the equipment at a speed higher; reduce the cost of maintenance by cutting down the comparatively large overhead resulting from transmission maintenance, and speed up working operations generally through the elimination of one transmission speed with a resulting gain of time while hauling.

Closing the series of technical discussions on Wednesday afternoon was the paper "Earth Moving Equipment and the Engineer" by F. A. Nikirk, Caterpillar Tractor Co., who also presented four sound motion pictures centering around the products manufactured by his firm.

In his discussion, Mr. Nikirk limited himself to earth moving in highway construction because "highway construction has involved more earth moving than any other branch of engineering construction during the past 20 years; more data are available showing cost trends and the effect thereon of improved methods and equipment."

Improvements in heavy machinery used for road construction has been of general benefit to everyone in that it has reduced the amount of "man killing" labor formerly required in highway construction; increased the number of skilled or semi-skilled workers required in highway construction; reduced the costs of such construction by cutting down the time necessary to complete a job, thereby saving the taxpayer money; has stimulated expansion in other industries through increased "amount of highway facilities, made possible by the use of power equipment and not the money expended."

"It is also evident," Mr. Nikirk said "that through the decreasing unit cost of construction, the traveler public received more in highway facilities for the invested dollar. This, in turn, invited more traffic which produced more revenues and renders economically sound the expenditure of increasing amounts of high construction. It was recently brought out before the Roads Committee of the House of Representatives, that for every dollar spent, under our present system, for highway construction, trade is stimulated to the extent of an additional $3.15. This effects employments in the automotive industry and the petroleum industry and their branches and in allied fields from the production of raw materials to the transportation and sale of the finished product. It also stimulates the construction and operation of garages, service stations, tourist camps and recreational facilities."

Mr. Nikirk further stressed that the automotive machinery field as a whole has benefited from the time and efforts expended in perfecting earth moving equipment which demands the most of its gears, transmissions, bearings, as well as frames and other structural members.

The necessity of incorporating in the design of earth-moving equipment the results of careful study of field requirements was urged in Mr. Nikirk's paper.

"Regardless of the length of experience in the design or manufacture of other types of machinery, an attempt to produce construction equipment without a thorough knowledge of job requirements is likely to lead to unhappy results," Mr. Nikirk warned.

In concluding, Mr. Nikirk pointed out that "the machine has benefited society by liberating mankind from much human drudgery, and created employment in new industries and related service activities where working conditions and opportunities are more favorable. Further intelligent use of machinery will result in economies that will liberate idle money, if enterprise is not hampered."

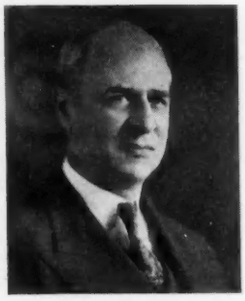
Gromer Heads Colorado Club

New officers were elected by members of the SAE Club of Colorado at their first meeting of the year, Sept. 10. The new chairman is George N. Gromer, supervisor of motor vehicles, Mountain States Telephone & Telegraph Co., and Fred R. Eberhardt, president, Eberhardt-Denver Co., is vice chairman. The meeting was devoted entirely to business matters.

About SAE Members

SAE Members serving with Chairman **CHARLES F. KETTERING** on the National Inventors Council include: **THOMAS MIDGLEY, JR.,** vice president, Ethyl Gasoline Corp.; **ORVILLE WRIGHT,** aeronautical engineer; and **FRED M. ZEDER,** vice chairman, board of directors, Chrysler Corp. Offices of the Council are in the Department of Commerce Building, Washington, D. C.

LEWIS C. ORD formerly consultant on planning and production to the British Air Ministry, who recently has been in Canada



Lewis C. Ord
On British Air Commission

as general manager of the Canadian Associated Aircraft Ltd., has been transferred to New York as consultant on planning and production to the British Air Commission, British Purchasing Commission.

HOWARD A. REINHART, formerly with the White Motor Co. in San Francisco, is now with the MacDonald Truck Co., of that city.

RAYMOND R. SNYDER, former chief engineer, Automatic Turbine Drive Co., Inc., is associated with **K. L. HERRMANN,** in research and development work at New Carlisle, Ind.

FREDERICK L. CREAGER has been advanced to superintendent of tool division by the R.C.A. Mfg. Co., Inc., Camden, N. J. He was superintendent of the engineering model shop.

THOMAS J. HERRICK, formerly instructor of applied mechanics at Purdue University, has joined the department of engineering mechanics at the University of Michigan.

The U. S. Army Ordnance Department has named **LT. GEORGE H. SCHOENBAUM,** Ordnance Reserve, Office of the Chief of Field Service, and **ROBERT S. BOONE,** junior engineer, artillery and automotive division, technical staff, to the Cooperative Fuel Research Committee.

LT. C. D. CASE, U.S.N.R., has been made assistant production superintendent, assembly and repair department, Naval Air Station, Pensacola, Fla. He formerly was officer in charge of the power plant division of the air station's ground school.

RAYMOND BEARDSLEY has been appointed secretary and **NEIL A. MOORE** a vice president of the Sealed Power Corp., Muskegon, Mich. Mr. Beardsley was assistant secretary and treasurer, and Mr. Moore was general manager of the company.

Early last month **VAL CRONSTEDT** was named executive engineer, Pratt & Whitney Aircraft, East Hartford, Conn. Prior to this advancement he was research engineer.

BURTON O. LEWIS has been advanced from the rank of Colonel to that of Brigadier General, Ordnance Department. He is attached to the office of Chief of Ordnance.

RALPH N. DuBOIS, who has been project engineer with the Lycoming Division of Aircraft Mfg. Corp., Williamsport, Pa., has joined Packard Motor Car Co., Detroit. There he is engineer in charge of development and testing in the company's aircraft division.

DELMAR G. ROOS, vice president and chief engineer of Willys-Overland Motors, Inc., has been elected to the board of directors of that company, according to a recent announcement by **JOSEPH W. FRAZER,** president. Formerly vice president and chief engineer of Studebaker, Mr. Roos was affiliated with Humber, Hillman, Talbott, Sunbeam, Ltd., England, before joining Willys-Overland in 1938. He was president of the SAE in 1934.

VIRGIL L. ILES has left the Cooper-Bessemer Corp., Mt. Vernon, Ohio, to work in the experimental department, Allison Division, General Motors Corp.

VINCENT H. HOEHN, formerly junior engineer, Packard Motor Car Co., Detroit, is seating engineer working on foam rubber cushions and pads with the U. S. Rubber Co., Mishawaka, Ind.

GEORGE J. CAMPBELL, formerly district manager, Johns-Manville Corp., Chicago, has been made assistant division manager.

Wright, Heron, and Taylor Return to Industry Posts

T. P. Wright, who has been cooperating on aeronautical problems with William S. Knudsen, coordinator of production, National Defense Advisory Commission, recently announced his resignation from the commission to return to his post of vice president in charge of engineering, Curtiss-Wright Corp., from which he had leave of absence. Mr. Wright continues with the N.D.A.C. on a consulting basis and is chairman of the Joint Army-Navy-British Standardization Committee on aircraft.

S. D. Heron, who also was on leave of absence to serve on the commission as expert on aviation gasoline, has returned to his post with the Ethyl Gasoline Corp.

Prof. Edward Storey Taylor also has resigned from the commission to return to Massachusetts Institute of Technology, which had granted him leave, as professor of aeronautical engineering. He is continuing on a consulting basis with the N.D.A.C., and is engine specialist on the Army-Navy-British Standardization Committee.

It was stated that since all of the Army contracts had been placed, along with most Navy and British orders, and planes and engines allotted to each, little coordinating work remained to be done in Washington. It is now up to industry, Mr. Wright said, to put through the production plan formulated by the commission during the last four months; adding that he is returning to his former post so that he can take part in the industry's effort.

SHERWOOD E. SKINNER, recently named general manager of the Olds Motor Works, will also be general manager of shell manufacturing undertaken by General Motors as a part of its national defense program, according to **C. E. WILSON,** acting president of General Motors Corp. Mr. Wilson also announced that the corporation has made preparations to fulfill a $9,505,600 War-Department order for shells at its heavy-press plant in Lansing.

WILLIAM J. ANDRES is chief engineer of the Linn Mfg. Corp., manufacturers of tractors at Morris, N. Y. Before taking this post he was development and research engineer with Bendix-Westinghouse Automotive Air Brake Co., Pittsburgh.

CHRIS. H. BOUVY, formerly engineer with Briggs Mfg. Co., Detroit, has joined Cadillac as engine designer.

ARTHUR J. SCAIFE, recently named senior ordnance engineer by the Ordnance Department, U. S. Army, has been assigned, as resident engineer on Heavy Tank, T-1, to the Baldwin Locomotive Works, Eddystone, Pa. Mr. Scaife, who was president of the SAE in 1932, was identified with the White Motor Co. from 1900 to 1936. He later was affiliated with Autocar for several years, and

Arthur J. Scaife
With Ordnance Department

more recently was consultant with Dean Gillespie & Co., Denver, Colo. Mr. Scaife has been a member of the SAE Ordnance Advisory Committee since 1930, and active on numerous other SAE committees. He was elected a life member of the Society in 1935.

R. D. KELLY, superintendent of engineering research, United Air Lines, has cooperated with **PROF. K. D. WOOD,** head of the aeronautical engineering department, Purdue University, in working out a new course on air transport engineering to be given at the University. Unlike other Purdue courses the instruction will be by United Air Lines engineers instead of regular faculty members.

LT. E. N. KLEMGARD, United States Naval Reserve, is lubrication engineer, internal-combustion engine laboratory, U. S. Naval Engineering Experiment Station, Annapolis, Md. Before taking this post he was consulting lubrication engineer with offices in Pullman, Wash.

CARLTON M. MYERS, engineer, Socony-Vacuum Oil Co., Inc., has been transferred from Albany to Poughkeepsie, N. Y.

J. BYRON JONES recently joined the research and development engineering department of Goodyear Aircraft Corp., Akron, Ohio. He previously was development engineer with the Fuller Brush Co., Hartford, Conn., and had earlier been on the engineering faculty of the Casey Jones School of Aeronautics.

G. E. TERPENNY is assistant procurement inspector (aircraft engines) with the U. S. War Department, Air Corps, Materiel Division, Wright Field, Dayton, Ohio. Mr. Terpenny was with the Columbia Engineering Corp., Columbus, Ohio, before his affiliation with the War Department.

J. MILTON DAVIES has been advanced from research engineer to assistant chief engineer by the Caterpillar Tractor Co., Peoria,

J. Milton Davies
Advanced

Ill. Mr. Davies is SAE vice president representing Tractor and Industrial Engineering.

Since Sept. 1, **JOHN J. BLOOMFIELD** has been project engineer, Menasco Mfg. Co., Burbank, Calif. He formerly was consultant on transmission devices with Vega Airplane Co., of the same city.

FRANK T. BUMBAUGH, who was manager of the bar and semi-finished products division, metallurgical department, Carnegie-Illinois Steel Corp., Pittsburgh, has been named metallurgical engineer, bar and semi-finished products, carbon and alloy.

ADOLPH MOSES, formerly mechanical engineer, Trubenizing Process Corp., New York, is designer with Allied Process & Engineering Co., Newark, N. J.

A. H. KRAUSE has resigned from the White Motor Co., Cleveland, to take up a new position in the automotive division of the Acrotorque Co., of the same city.

For the duration of the war **CLIFFORD M. TEMPEST** will be instructing Royal Australian Air Force mechanics in engine maintenance and overhaul as instructor in the defense training section of the Sydney Technical College. Mr. Tempest was formerly service manager and technical adviser, Westcott Hazell's & Co., Sydney. He writes: "If any member interested in Australian affairs cares to write, the letter would be most welcome and promptly answered." His address is Box 2019L, G.P.O., Sydney, New South Wales, Australia.

JOHN A. C. WARNER, SAE general manager, has been appointed to the committee of engineers charged with the establishment of qualifications for listings in *Who's Who in Engineering,* fifth edition. Engineers throughout the country will soon receive material, questionnaires, and previously printed records, bearing on this work, according to Dr. W. S. Downs, its editor.

ARTHUR DALE MILLER has been named safety engineer by the Ethyl Gasoline Corp. He will make his headquarters in San Antonio, Texas. Mr. Miller formerly was field representative for the company.

FREDERICK C. HENDY, formerly a member of the SAE Student Branch at Purdue University, is experimental test engineer with Pratt & Whitney Aircraft, East Hartford, Conn.

CHARLES B. KING, WALTER C. BAKER, and **JULIAN CHASE** are SAE Members among "Motordom's Golden Pioneers" who were cited for awards because of their significant contributions to the development of the motor car, at the Automobile Old Timers' second annual luncheon in New York, Oct. 16. "Motordom's Golden Pioneers" are members of the Automobile Old Timers whose activities date back 40 years.

HARRISON L. HART recently opened a new office at 4636 West Fulton St., Chicago. He is representing the Sheller Mfg. Corp., Portland, Ind., and its subsidiary the Hardy Mfg. Corp., Pendleton, Ind.

R. J. BENDER, head of the fuel oil department of Sinclair Refining Co. in Chicago, is conducting a series of "Automatic Heating Clinics" throughout the Middle Western States, to bring the story of domestic heating closer to the American public.

DR. GUSTAV EGLOFF, Universal Oil Products Co., Chicago, recently gave a series of lectures on "Modern Motor Fuels" before various sections of the American Chemical Society and students and faculties of several universities.

CLARENCE S. BRUCE, secretary of the SAE Washington Section, has been advanced from the post of assistant automotive engineer to that of automotive engineer by the National Bureau of Standards.

GERALD A. PETERSON, graduate of the General Motors Institute, Flint, Mich., is engineer with the Boeing Aircraft Corp., Seattle, Wash.

T. E. WILSON, chassis engineer, White Motor Co., Cleveland, has taken over additional duties of production and special equipment.

Prize Winners

M. G. Kaufman, Case School of Applied Science, is author of the paper voted best in the Cleveland Section's Student Paper Contest, according to a recent announcement by the Section's Governing Board. His contribution, "Airway Radio Range," won him $50 and a student membership in the Society.

Another Case student, E. C. Seib, submitted the second best paper, and Roland Pintner, a cooperative student at General Motors Institute, entered the paper judged third best. Messrs. Seib and Pintner also were awarded SAE student memberships by the Section.

J. E. JURY, who created and edited the Panorama of Lubrication for the Shell Oil Co., Inc., St. Louis, has left Shell to establish his own company – Business Collaborators – with offices in the Shell Building, St. Louis. The new company is engaged in marketing consulting work.

JOHN LEWIS DILWORTH, who has been instructor, mechanical engineering department, Virginia Polytechnic Institute, Blacksburg, Va., now holds the same post at Pennsylvania State College, State College, Pa.

GEORGE F. HATCH has taken a position in the testing laboratory of the Cooper-Bessemer Corp., Mount Vernon, Ohio. He formerly was a student at the U. S. Diesel Engineering School, Boston.

For Distinguished Public Service

SAE President Arthur Nutt (left) receiving the B. F. Goodrich Co. award for distinguished public service from SAE Member K. D. Smith, technical chief of the rubber company's tire division.

Mr. Nutt was honored in special Automotive Week ceremonies at the Goodrich Arena at the World's Fair, Oct. 3.

"Free discussion of national defense problems by competent engineers should be encouraged if the nation is to outdo totalitarian efficiency," Mr. Nutt said in a talk following the presentation.

LESLIE F. ZSUFFA, assistant editor of The American Society of Mechanical Engineers, and a first lieutenant in the Quartermaster Reserve, U. S. Army, was ordered into active service Oct. 4, for one year under the provisions of the National Guard and O.R.C. Bill recently passed by Congress. Having been granted a leave of absence by the ASME, Lt. Zsuffa is now serving as assistant to the transportation officer, Office of the Corps Area Quartermaster, Governors Island, N. Y.

FRANK P. LAWLER has resigned as chief engineer of the tractor equipment division of the Buckeye Traction Ditcher Co., Findlay, Ohio, to become chief engineer of the G-L-T Corp., San Francisco. His headquarters are at the company's Chicago office.

CHARLES M. LICHY has been promoted from metallurgical engineer in the Detroit territory to assistant metallurgist of the Pittsburgh Works by the Jones & Laughlin Steel Corp.

ALTON Du FLON, SAE student member who has been attending Cooper Union Institute of Technology, New York, has started work with the B. G. Corp., New York.

WILLIAM B. STOUT, president of Stout Engineering Laboratories, was the principal speaker at the graduation of 17 students from the Ford Engineering School, Oct. 12.

F. C. KERNS, The Texas Co., was elected president of the National Lubricating Grease Institute at a meeting held in Chicago early

F. C. Kerns
Heads Grease Institute

last month. **SYDNEY BEVIN,** Fiske Brothers Refining Co., was elected vice president, and **G. W. MILLER,** Battenfeld Grease & Oil Corp., was re-elected executive secretary. **H. G. VESPER,** Standard Oil Co. of Calif., and **CARL W. GEORGI,** Quaker State Oil Refining Corp., were elected to the board of directors.

Among SAE Members scheduled to take part in the 1940 Annual Meeting program of the American Society of Mechanical Engineers, New York, Dec. 2-6, are: **R. F. GAGG,** assistant chief engineer, Wright Aeronautical Corp.; **F. P. ZIMMERLI,** chief engineer, Barnes-Gibson-Raymond, Inc.; **EARLE BUCKINGHAM,** professor of mechanical engineering, Massachusetts Institute of Technology. Mr. Gagg will lead discussion on "Machine-Line Production of Aircraft-Engine Materials;" Mr. Zimmerli's topic will be "Effect of Temperature on Coiled Steel Springs Under Various Loadings;" and Prof. Buckingham will talk on "Design and Performance of Gear Teeth with Enveloping Profiles."

JOHN L. SCHMELLER has been promoted from the post of sales manager, National Bronze & Aluminum Foundry Co., to that of vice president in charge of sales.

B. FRANK JONES, chief engineer, truck division, White Motor Co., Cleveland, has been appointed by the company as chief engineer in charge of national defense equipment.

Since Sept. 1, **IRA J. SNADER** has been plant manager with the Republic Aircraft Products Corp., Detroit, Mich. He was previously research engineer, machinery division, Ex-Cell-O Corp., also of Detroit.

Baltimore Chairman

R. J. Grow

R. J. GROW is chairman of the SAE Baltimore Section and not of the Buffalo Section, as was shown in the October SAE JOURNAL. The Buffalo Section is headed by **G. M. MAGRUM.**

DAVID A. FISHER, who was instructor of mechanical engineering at the College of the City of New York, has joined the mechanical engineering department of Tufts College, Medford, Mass., as assistant professor.

FREDERICK P. BAGGERMAN now holds the post of analyst, standards division, Murray Corp. of America. He was research engineer with the Shell Oil Co., Inc., Wood River, Ill.

CURT SAURER, who for the past several years has been associated with the Firestone Tire & Rubber Co., and previously with the U. S. Rubber Co., has resigned to open an office at 4835 Woodward Ave., Detroit, as a manufacturers' representative and for rubber parts engineering.

EDWARD DUNNING has been transferred by the Shell Oil Co., Inc., from St. Louis, Mo., to the company's Wood River, Ill., refinery, where he is engineer in charge of the products application department.

JOSEPH GESCHELIN, Detroit editor, *Automotive Industries,* was author of a series of articles on manufacturing plants which won an award of merit for *Automotive Industries* in the recent competition conducted by *Industrial Marketing,* for editorial achievement during 1940. Mr. Geschelin will discuss high spots of mechanical design features of 1941 cars before the following SAE Sections; Cleveland on Nov. 11, Indianapolis, Nov. 14, and Syracuse, Nov. 24.

R. W. RICHARDSON has transferred from Esso Laboratories, Standard Oil Development Co., Elizabeth, N. J., where he was in charge of lubricants research, to Esso Laboratories, Standard Oil Co. of La., Baton Rouge, La.

ARCH L. FOSTER, former technical editor of *National Petroleum News,* who for the past year has been affiliated with the Lubri-Zol Sales Co., Cleveland, recently joined the research department of Phillips Petroleum Co., Bartlesville, Okla.

FRED J. BOLL is one of a group of engineers selected by the Lockheed Aircraft Corp., Burbank, to receive an intensive course in aeronautical engineering at California Institute of Technology, and further training at the Lockheed plant, before assignment to an engineering post with the company. Mr. Boll formerly was with the Vega Airplane Co., Burbank.

ROBERT F. KOHR has joined the Packard Motor Car Co., Detroit, as experimental engineer. He was friction materials engineer with the Thermoid Co., Trenton, N. J.

JAMES TENETY, JR., formerly a student at Pratt Institute, Brooklyn, N. Y., is machinery development engineer with the Celanese Corp. of America, Cumberland, Md.

Appointment by Air Associates, Inc., Garden City, N. Y., of **M. MERWIN EELLS** as assistant to the general manager and specialist on engineering phases of the company's special contracts, has been announced by **F. LeROY HILL,** president. For seven years prior to joining Air Associates, Mr. Eells was vice president in charge of engineering with the Breeze Corps., Newark, N. J.

LESSITER C. MILBURN, who has been works manager of the St. Louis Airplane Division, Curtiss-Wright Corp., since 1937,

Lessiter C. Milburn
Assistant General Manager

has been advanced to the post of assistant general manager. Before joining Curtiss-Wright, Mr. Milburn was vice president of the Glenn L. Martin Co. with which he had been affiliated for more than 15 years.

CARL H. KOPPLIN, University of Minnesota graduate, is test engineer at Pratt & Whitney Aircraft, East Hartford, Conn.

S. B. SPRINGER, formerly automotive engineer, Fidelity & Casualty Co. of N. Y., has taken the post of automotive safety engineer with the Globe Indemnity Co., with

S. B. Springer
Changes
Companies

headquarters at the company's Detroit branch office.

A copy of the book, "Service Station and Motor Mechanics' Manual," by **GEORGE GEORGE,** Sydney, Australia, mentioned in the October SAE Journal, has been received at SAE Headquarters and is available in the Society's library. Some of the division headings of the 1237-page volume are: The Motor Car Chassis and its Component Parts and How to Service Them; The Motor Car Engine: Its Operation, Servicing and Repair; The Fuel System, Including Vacuum-Tank Supply, Fuel Pumps, Fuel Gages, and Carburetors; Electrical Equipment and its Servicing; Modern Car-Testing and Tune-up Equipment; Body Repair and Renovation; Some Modern Workshop Operations. The book bears a foreword by Sir Malcolm Campbell. It is published by Angus & Robertson Ltd., of Sydney, Australia, and London, England. The price in Australia is $19.20 in American money. Mr. George has been a foreign member of the SAE since 1937.

About Authors

(Concluded from page 13)

Consolidated, Mr. Jackson is chief structural test engineer in charge of all static tests. These range from full-scale wing destruction tests to vibration tests in test flights.

■ ***During the war, 1917-1918, Prof.*** **W. E. LAY** ***(M '19) supervised the training of some 1250 automotive mechanics in hastily assembled buildings and with sketchy equipment, on the University of Michigan campus. He had graduated from the University in 1915, and had taken the post of teaching assistant. He has continued on the faculty and is now professor of mechanical engineering in charge of the automotive laboratory. He has done practically continual experimental test and research work, both at the University laboratory and at the laboratories of Packard, Chevrolet, General Motors Proving Grounds, Campbell, Wyant & Cannon, the NACA, and others. In collaboration with H. M. Jerome, he developed a radically new type of house-heating boiler which is being built and marketed by the Gar Wood Engineering Co. He is author of a number of SAE papers and has been active on several SAE Committees. A member of the Officers Reserve Corps, Prof. Lay is a specialist assigned to the Ordnance Corps, with the rank of Major.***

■ ***Born in the United States and educated in England,*** **PAUL H. WILKINSON** ***served his apprenticeship in engineering with the British Thomson-Houston Co., Ltd. He left there in 1914 to get into aviation, and during the war served with A. V. Roe & Co., Ltd., and the Royal Aircraft Establishment, chiefly on inspection work. He returned to the United States in 1921 and was aircraft inspector with the Boeing Airplane Co. Mr. Wilkinson then spent several years in Southern California, engaged in civil engineering, before becoming inspector of aircraft with the Douglas Aircraft Co. in 1934. Since 1935 he has specialized in diesel aircraft engines and their application to aviation. He has written numerous articles on the subject, including a book, just published, entitled "Aircraft Diesels." Mr. Wilkinson has been aviation editor of "Diesel Progress" since 1935, and is in business as consultant on diesel aviation.***

Albert L. Clough

Albert L. Clough, one of the men who helped found the Society of Automotive Engineers in 1905, died Sept. 21, at the age of 71. Prominent as an independent consulting automotive engineer, Mr. Clough lived most of his life in Manchester, N. H., where he took considerable interest in civic activities. He served as an Alderman in that city from 1910 until 1939, and in 1936 was president of the New Hampshire Academy of Science.

Graduating from the Massachusetts Institute of Technology in 1891, Mr. Clough first entered the electrical industry, starting with the General Electric Co., and later becoming general manager of the Brodie Electric Co. In 1903 his interest in automobiles took him to New York as associate editor of *The Horseless Age*. He held that post until 1913, and for a time was also automobile editor for the *American Review of Reviews*. After giving up his two editorial posts, Mr. Clough devoted himself to his consulting work and to writing technical articles.

Henry H. Timken

Henry H. Timken, chairman of the board of the Timken Roller Bearing Co., Canton, died Oct. 14. He was 72 years old and had been a member of the Society since 1920.

After graduating in law from the University of California in 1890, Mr. Timken engaged in its practice until a hearing deficiency interfered with his legal work and he entered his father's carriage business. This developed, in 1901, into the Timken Roller Bearing Axle Co., which later separated into the Timken-Detroit Axle Co., with headquarters in Detroit, and the Timken Roller Bearing Co., of Canton. Mr. Timken was president of the original company and continued in that post with the Canton organization until his election as chairman of the board in 1928. He also served for a time as president and chairman of the Timken-Detroit Axle Co., and as chairman of the Hercules Motors Corp. of Canton.

Mr. Timken always shunned publicity, even to the extent of restricting his biography to two lines when invited to list his accomplishments for "Who's Who in America" and "Who's Who in Commerce and Industry."

First president of the Canton Chamber of Commerce, Mr. Timken, through the Timken Foundation, which he headed, donated to the city school system the completely equipped Timken Vocational High School, considered one of the finest technical schools in the nation. This was but one of his many philanthropic acts.

Everett W. Turley

Following an operation for a ruptured appendix, Everett W. Turley died on Sept. 6. Mr. Turley, who became a member of the Society in 1917, was in charge of maintenance, transportation, purchasing, and personnel for the Olson Transportation Co., Green Bay, Wis. He was 49 years of age.

Mr. Turley received his B.S. Degree from the Armour Institute of Technology in 1912, earning his tuition and paying his expenses by working in the Haynes Automobile factory during vacations and by repairing automobiles.

For ten years after graduation, Mr. Turley was manager of the automotive service department of Wilson & Co., meat packers, in charge of transportation and maintenance of the company's 650 vehicles. He later joined the sales force of Autocar Sales & Service Co., Chicago. He became affiliated with the Olson Transportation Co. in 1936.

Donald W. Campbell

News has reached the Society that Donald W. Campbell, engineer with the Socony-Vacuum Oil Co. at Paulsboro, N. J., was drowned during his summer vacation. He was 38 years old and had been a member of the SAE since 1933.

While attending the University of Wisconsin, from which he was graduated in 1928, Mr. Campbell started, during vacations, with the J. I. Case Co., as junior engineer, working at different times with that company from 1926 until 1930. He later held engineering posts with Illinois Tool Works, Ideal Roller & Mfg. Co., and was chief engineer of the Campbell Buchanan Co. In 1934, Mr. Campbell became engineer in the gas-power engineering department of International Harvester Co., and two years later began research and development work with Socony-Vacuum.

During a period following his graduation, Mr. Campbell received six months of flight training and ground-school practice as a cadet with the Army Air Corps.

Harley C. Loney

Harley C. Loney, president of the Harley C. Loney Co., died on Sept. 20. Mr. Loney, who was 48 years old, had been an associate member of the Society since 1938.

Before 1930, when he became president of the automotive parts and accessory manufacturing company which bears his name, Mr. Loney was for a number of years in charge of sales and new developments for the Riverside Forge Co., Jackson, Mich. He earlier was purchasing agent for the Jaxon Steel Products Co., of the same city, and assistant factory manager of the Allen Motor Co., Fostoria, Ohio.

APPLICATIONS Received

The applications for membership received between Sept. 15, 1940, and Oct. 15, 1940, are listed below. The members of the Society are urged to send any pertinent information with regard to those listed which the Council should have for consideration prior to their election. It is requested that such communications from members be sent promptly.

Canadian Section

FOWLER, ALEXANDER MURRAY, manager, industrial sales, Imperial Oil Ltd., Toronto, Ont., Canada.

Chicago Section

BALIS, MOORMAN RANDALL, research engineer, Bendix Products Division, Bendix Aviation Corp., South Bend, Ind.

BLOCKS, EMIL C., JR., testing engineer, Union Special Machine Co., Chicago.

CHAPMAN, CHARLES R., sales engineering, Standard Oil Co. of Ind., Whiting, Ind.

CONROY, CHARLES L., president and development engineer, Anchor Coupling Co., Waukegan, Ill.

GRIDLEY, GLENN C., vice president and works manager, Mechanics Universal Joint Division, Borg-Warner Corp., Rockford, Ill.

HAGENBOOK, L. D., assistant chief engineer, Goodman Mfg. Co., Chicago.

HANSEN, ZENON C. R., National account representative, International Harvester Co., Chicago.

RENOUF, ROLFE, designing engineer, The Austin-Western Road Machinery Co., Aurora, Ill.

WATROUS, CHRISTOPHER, B., lubrication engineer, Valvoline Oil Co., Chicago.

WUESTENBERG, F. C., service manager, The Austin-Western Road Machinery Co., Aurora, Ill.

Cleveland Section

BROWN, EDWARD F., sales engineer, Ohio Ball Bearing Co., Cleveland.

DINSMORE, RAY PUTNAM, manager, development department, The Goodyear Tire & Rubber Co., Akron, Ohio.

DUDLEY, WINSTON M., instructor, Case School of Applied Science, Cleveland.

GANO, KENNETH C., engineer, The Leece-Neville Co., Cleveland.

KARR, WALTER F., sales engineer, Fafnir Bearing Co., Cleveland.

MENZ, PAUL J., sales engineer, Ohio Ball Bearing Co., Cleveland.

PASCO, THEODORE GUTHRIE, assistant service engineer, The Leece-Neville Co., Cleveland.

ZUSKE, HAROLD J., engineer, The Leece-Neville Co., Cleveland.

Detroit Section

BARRETT, JAMES J., engineering representative, The Bishop & Babcock Mfg. Co., Detroit.

DEISLEY, EDWARD J., chief body engineer, Edward G. Budd Mfg. Co., Detroit.

DEKKER, G. J., manager, Air Reduction Sales Co., Detroit.

FELDER, HOWARD B., junior engineer, Research Laboratory Division, General Motors Corp., Detroit.

HALL, WALTER, L., draftsman, Yellow Truck & Coach Mfg. Co., Pontiac, Mich.

HAWTHORNE, EUGENE P., engineer, Budd Wheel Co., Detroit.

KRAUSE, RAYMOND STUART, full size layout (chassis), Packard Motor Car Co., Detroit.

MORGAN, ROBERT G., sales engineer, Timken Roller Bearing Co., Detroit.

NICOLETTI, GEORGE W., sales engineer, New England High Carbon Wire Co., Detroit.

SINCLAIR, CHARLES W., chief engineer, Kelsey-Hayes Wheel Co., Detroit.

SPANGENBERG, R. K., engineer in training, Ethyl Gasoline Corp., Detroit.

SPLITSTONE, JOHN RAGON, sales engineer, Timken-Roller Bearing Co., Detroit.

WOBROCK, MARVIN T., designer, Chevrolet Motor Division, General Motors Corp., Detroit.

Indiana Section

BADGLEY, OLLIE V., general manager, Delco-Remy Division, General Motors Corp., Anderson, Ind.

CROSBY, FRANK MILLER, assistant instructor, Purdue University, West Lafayette, Ind.

Kansas City Section

HELLING, F. H., secretary-treasurer, Penn-Central Oil Co., Kansas City, Kansas.

Metropolitan Section

BLEYLE, GEORGE ALFRED, test engineer, Wright Aeronautical Corp., Paterson, N. J.

CARRY, WILLIAM J., engineer, The B. G. Corp., New York.

CHERRNAY, JULIUS, carburetor mechanic, Flushing Motor Service, Flushing, L. I., N. Y.

CLARK, ROBERT H., general superintendent of transportation, Consolidated Edison Co. of New York, Inc., New York.

CROSSETTE, MURRAY FISHER, JR., supervisor, Wright Aeronautical Corp., Paterson, N. J.

CUBBINS, WILLIAM ROBERT, JR., district sales manager, Trailer Co. of America, Long Island City, N. Y.

FLYNN, ROLAND W., division lubrication engineer, Gulf Oil Corp., New York.

HANAUER, ELBERT A., automotive engineer, Mack Mfg. Corp., Long Island City, N. Y.

IMMEL, JOHN R., experimental engine tester, Wright Aeronautical Corp., Paterson, N. J.

KLENKE, WILLIAM H., JR., export sales manager, Aviation Mfg. Corp., New York.

MAXWELL, RICHARD B., test engineer, Wright Aeronautical Corp., Paterson, N. J.

MEHRHOF, KENNETH, C., engine tester, Wright Aeronautical Corp., Paterson, N. J.

MICKA, JOSEPH, test engineer, Wright Aeronautical Corp., Paterson, N. J.

NEUGEBAUER, GEORGE H., instructor in machine design, Cooper Union, New York.

PERRY, MILLARD FILLMORE, engineer, Curtiss Propeller Division, Curtiss-Wright Corp., Clifton, N. J.

ROWE, M. ROBERT, junior engineer, Wright Aeronautical Corp., Paterson, N. J.

RUDD, JOHN KROM, junior test engineer, Wright Aeronautical Corp., Paterson, N. J.

SAVAGE, JOHN A., assistant superintendent of motor vehicles, Hoffman Beverage Co., Newark, N. J.

SOPHIAN, RAY, junior engineer, Wright Aeronautical Corp., Paterson, N. J.

VERMEULEN, JOHN A., junior engineer, Wright Aeronautical Corp., Paterson, N. J.

WEISS, ORIN ANDREW, consulting engineer, P. O. Box 19, Station C., New York.

Milwaukee Section

JANES, JOHN J., engineer, Standard Foundry Co., Racine, Wis.

JOHNSON, ROY A., designing engineer, Allis Chalmers Mfg. Co., Milwaukee.

New England Section

BAKER, FRANK, junior engineer, American Diesel Engine Corp., Boston.

BATSTONE, GEORGE CECIL, owner, Bee-Line Systems, Charlestown, Mass.

CONNOR, BERNARD D., superintendent of transportation, Boston Consolidated Gas Co., Boston.

Northern California Section

OMORI, TAKEO, aeronautical engineer, Aeronautical Research Institute of Tokyo, Tokyo, Japan. Mail: c/o Yamato Hotel, 717 California St., San Francisco, Calif.

Northwest Section

RITTER, HARRY A., superintendent of equipment, Tacoma Railway & Power Co., Tacoma, Wash.

Oregon Section

HANSEN, VERNON EDWARD, engineer, Wentworth & Irwin, Inc., Portland.

MITCHOFF, J. J., body shop foreman, Wentworth & Irwin, Inc., Portland.

WAGNER, DICK F., chief engineer, Wentworth & Irwin, Inc., Portland.

Philadelphia Section

BISHOP, THOMAS S., 3rd, Diesel engineer, Mack Mfg. Corp., Allentown, Pa.

ELLIS, BROWER R., patent engineer, Mack Mfg. Corp., Allentown, Pa.

POPE, WINSLOW B., designer, Budd Wheel Co., Philadelphia.

Pittsburgh Section

LAHER, J. J., superintendent of transportation, Rieck McJunkin Dairy Co., Pittsburgh.

Southern California Section

COOPER, EARL P., chief automotive engineer, Union Oil Co. of Calif., Los Angeles.

GREEN, BARTLETT, relief foreman, Santa Fe Trail Transportation Co., Los Angeles.

HEINEMANN, EDWARD H., chief engineer, Douglas Aircraft Co., Inc., El Segundo, Calif.

JOHNSON, WARREN HENRY, tire maintenance foreman, Department of Water & Power, City of Los Angeles, Los Angeles.

SCHWIMMER, JAMES FRANKLIN, assistant project engineer, Menasco Mfg. Co., Burbank, Calif.

SIMMONS, EDWARD E., JR., research assistant, California Institute of Technology, Pasadena, Calif.

WHITTLESEY, JAMES W., engineer, Kinner Motors, Inc., Glendale, Calif.

Southern New England Section

BUCK, RICHARD S., research engineer, Pratt & Whitney Aircraft Division, United Aircraft Corp., East Hartford, Conn.

CLARK, JOHN OLSTON, weight analyst, Pratt & Whitney Aircraft Division, United Aircraft Corp., East Hartford, Conn.

HAYNES, NATHANIEL, designer, Pratt & Whitney Aircraft Division, United Aircraft Corp., East Hartford, Conn.

MILLEN, LINWOOD F., weight analyst, Pratt & Whitney Aircraft Division, United Aircraft Corp., East Hartford, Conn.

OSBORN, HENRY CLAY, III, experimental test engineer, Pratt & Whitney Aircraft Division, United Aircraft Corp., East Hartford, Conn.

Washington Section

ALLAN, JAMES A., manager, Allied Suppliers Co., Washington, D. C.

ESSEX, HENRY A., junior mechanical engineer, National Advisory Committee for Aeronautics, Langley Field, Va.

NELSON, FREDRIC A., layout man, Glenn L. Martin Co., Baltimore, Md. Mail: 4617 N. Dittmar Road, Arlington, Va.

SANDIN, GUSTAVE B., service manager, The White Motor Co., Washington, D. C.

WASIELEWSKI, EUGENE W., assistant engineer, National Advisory Committee for Aeronautics, Langley Field, Va.

Outside of Section Territory

BRITISH COLUMBIA ELECTRIC RAILWAY CO., LTD., Vancouver, B. C.

FAUST, NILE E., service representative, Chrysler Corp., Detroit. Mail: 246 Woodford St., Portland, Maine.

NICHOLS, DE OWEN, JR., instructor, mechanical engineering, University of Oklahoma, Norman, Okla.

REINBERG, HENRY C., chemical engineer, Department of Revenue, Motor Fuel Laboratory, State of Louisiana, Baton Rouge, La.

WAITE, PHILIP M., estimator, Aero Supply Mfg. Co., Inc., Corry, Pa.

Foreign

CHAPMAN, CLIFFORD CHARLES, draftsman, Rolls-Royce, Ltd., Derbyshire, England.

ENGINEER, FRAMROX DARASHAW, works manager, Bombay Cycle & Motor Agency of Secunderabad, Secunderabad (Deccan) India.

NEW MEMBERS Qualified

These applicants who have qualified for admission to the Society have been welcomed into membership between Sept. 15, 1940, and Oct. 15, 1940.

The various grades of membership are indicated by: (M) Member; (A) Associate Member; (J) Junior; (Aff.) Affiliate Member; (SM) Service Member; (FM) Foreign Member.

Baltimore Section

NIGHTINGALE, ROBERT G. (M) project engineer, Glenn L. Martin Co., Baltimore (mail) R.F.D. #6, Hillen Road, Towson, Md.

Canadian Section

EVERITT, JACK (J) inspector, National Steel Car Corp., Malton, Ontario (mail) 444 Roselawn Ave., Toronto, Ontario.

GAMMAGE, JOHN EDWIN (A) sales manager, Hayes Steel Products, Ltd., Merritton, Ontario.

POLLARD, HAROLD (M) consulting engineer, Royal Canadian Air Force (mail) 569 Oriole Parkway, Toronto, Ontario.

RAE, ALLAN (A) sales and service, A. Schrader's Son, Division of Scovill Mfg. Co., Inc., 334 King St., East, Toronto, Ontario.

SCRIVER, BRUCE MACKENZIE (J) supervising engineer, Consolidated Engines & Machinery Co., Ltd., 420 Lagauchetiere St., West, Montreal, Quebec.

Chicago Section

BENNETT, JACK OLEN (J) research engineering, United Air Lines Transport Corp., 5959 S. Cicero Ave., Chicago.

EDDY, FRANKLIN O. (J) research engineer, Standard Oil Co. (Ind.) Engine Laboratory, Whiting, Ind.

TARTER, HENRY G. (A) project engineer, Bendix Products Division, Bendix Aviation Corp., South Bend, Ind. (mail) 1444 Sunnymede Ave.

Cleveland Section

NORBERG, CARL F. (M) executive, Willard Storage Battery Co., 246 East 131st St., Cleveland (mail) 3311 Ingleside Road, Shaker Heights.

PRASSE, HERBERT F. (J) draftsman, Thompson Products, Inc., 2196 Clarkwood Road, Cleveland (mail) 13017 Brackland Ave.

Dayton Section

BENT, A. J. (A) representative in charge of Cincinnati District, Bendix-Westinghouse Automotive Air Brake Co., Pittsburgh, Pa. (mail) 833 Temple Bar Bldg., Cincinnati, O.

Detroit Section

BERNTHAL, ARTHUR FREDERICK (M) metallurgist, Bundy Tubing Co., 10951 Hern Ave., Detroit.

BROWN, BOYD S. (A) sales manager, Detroit Gasket & Mfg. Co., 12640 Burt Road, Detroit.

HIRSCH, F. PETER (M) consulting engineer, Aeroquip Corp., Jackson, Mich.

OLSON, C. R. (A) vice chairman, general manager, Labor Relations, 11th State Employers Area Committee, Room 2866, Penobscot Bldg., Detroit.

ROSE, HAROLD E. (M) cushion spring engineer, Fisher Body Division, General Motors Corp., Plant, 27-2, Detroit.

SANDERS, RUSSELL F. (M) special test engineer, Chevrolet Motor Division, General Motors Corp., Detroit (mail) 626 Union St., Milford, Mich.

STRATTON, CARL E. (A) Detroit sales representative, Harrison Radiator Division, General Motors Corp., Lockport, N. Y. (mail) 10-261 General Motors Bldg., Detroit.

WICKHAM, MONT, DR. (A) president, General Materials of Michigan, Inc., 910 Fisher Bldg., Detroit.

Indiana Section

DETERS, JOHN F. (J) fuels research, Standard Oil Co. (Ind.), Whiting, Ind.

GADDIS, WILLIAM C. (A) local manager, Anaconda Wire & Cable Co., Anderson, Ind.

Metropolitan Section

AMBROSE, FRANK J. (M) president, general manager, Aviation Institute of Technology, Inc., 3601 35th Ave., Long Island City, N. Y.

BRALEY, W. H. (M) field engineer, Peter A. Frasse & Co., Inc., 17 Grand St., New York.

CRAGIN, ROBERT B. (M) chemical engineer, M. W. Kellogg Co., 225 Broadway New York.

MCCARTHY, JOSEPH P. (A) secretary, C & C Sales Corp., 1775 Broadway, New York.

MEADOR, DUIS WESTON (J) test engineer, Wright Aeronautical Corp., Paterson, N. J. (mail) Pines Lake, R.F.D. 1.

PERKINS, KENDALL (M) research engineer, American Airlines, Inc., N. Y. Municipal Airport, New York.

STARK, W. THOMAS (J) test engineer, Wright Aeronautical Corp., Paterson, N. J. (mail) Beech Terrace, Pines Lake.

VAN OVERVEEN, J. P. (J) 1705 Caton Ave., Brooklyn, N. Y.

Milwaukee Section

FROMM, W. H., JR., (J) sales engineer, Dumore Co., Racine, Wis.

SCHRECK, HENRY (M) consulting engineer, diesel & gas engines, Fairbanks, Morse & Co., Beloit, Wis. (mail) 1208 Chapin St.

STERNBERG, ERNEST R. (M) sales engineer, Sterling Motor Truck Co., Inc., 2021 South 54th St., Milwaukee.

Northern California Section

PANELO, PEDRO D. (A) 314 L St., Sacramento, Calif.

Northwest Section

KETCHUM, LEE (A) sales engineer, Six Robblees, Inc., 1102 12th Ave., Seattle, Wash.

Philadelphia Section

BABCOCK, PAUL R. (M) ceramic engineer, Frenchtown Porcelain Co., Frenchtown, N. J.

RICHARDSON, DAVID (A) Philadelphia representative, Chicago Rawhide Mfg. Co., Chicago. (mail) 1237 Spring Garden St., Philadelphia.

SEEBURGER, RAYMOND C., JR. (M) engineer, SKF Industries, Inc., Front St. and Erie Ave., Philadelphia (mail) 4329 Pechin St., Roxborough.

Pittsburgh Section

HOPPENSTAND, DAVID (M) president, Hopkan Rivet Co., Mechanical Laboratories, Inc., 128 Latham St., Pittsburgh, 6.

WEBB, CHARLES C. (M) chief engineer, Wheeling Stamping Co., Wheeling, W. Va. (mail) 74 14th St.

St. Louis Section

ERICSSON, LEROY J. (M) engineer, Carter Carburetor Corp., 2840 North Spring Ave., St. Louis, Mo.

Southern California Section

COYLE, DANIEL K. (M) chief engineer, Diesel Western Co., 333 West Washington Blvd., Los Angeles.

DONOVAN, ROBERT C. (M) designer, Douglas Aircraft Co., Inc., El Segundo, Calif. (mail) 3916 Highland Ave., Manhattan Beach, Calif.

Southern New England Section

CALVIN, JOHN H. (J) senior test engineer, Hamilton Standard Propellers, Division of United Aircraft Corp., East Hartford, Conn. (mail) P. O. Box 132, Glastonbury, Conn.

SELAN, JOSEPH S. (A) test operator, Pratt & Whitney Aircraft, Division of United Aircraft Corp., East Hartford, Conn. (mail) 29 Bidwell Ave.

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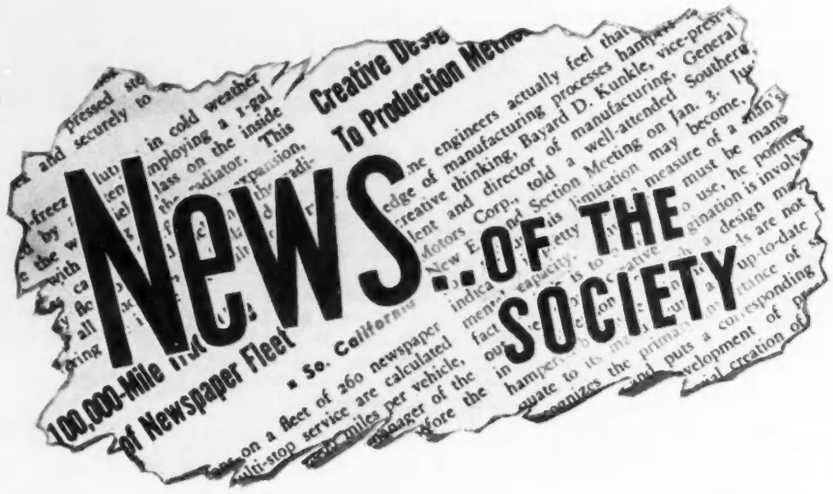

25,000 Plane Production in 1942 Predicted; Military Value of Air Transport Stressed

▪ *So. New England*

OUR present situation in the air is "extremely critical," Grover Loening, nationally known consulting aeronautical engineer, told 200 members and guests of the Southern New England Section in Hartford, Oct. 2. It will be several years, he declared, before we have an adequate air force. Our 1940 production of aircraft will be about 8000, he said, predicting double that number in 1941, and 25,000 in 1942.

The present European war, he stated, has taught us a number of important lessons in military aviation. The first and most important of these, he told his SAE audience, is the use of aircraft for transporting men, munitions, and supplies.

When Franco used air transports to bring troops from Spanish Morocco, he said, Germany was the only country to pay any attention to it. Later, he added, when Hitler found that poor Austrian roads hindered transporting troops to Vienna by motor truck, he had them withdrawn and in a single day landed 3000 Gestapo troops in that city by airplane. As the latest demonstration of the military value of air transport, Mr. Loening pointed to the landing of 43,000 men in Oslo, Norway, in two days, by the Germans. About 100 planes carrying 20 men each, with equipment, making a round trip every 2 hr and working 20 hr per day, were needed for the job, he said.

As an interesting comparison, Mr. Loening noted that the transportation of 700 U. S. Army soldiers to Alaska, an operation which took 43 days by Army transport through the Panama Canal, could have been done in two days with a fleet of DC-3's.

The second lesson, Mr. Loening said, is that bombers come first in importance and that the best defense against a bomb attack is to get the enemy's bombers before they take off from home. In order to make a fence against bombers around London alone, he declared, about 1000 fighter planes in the air at all times would be required to see that no German ships get through.

The British were credited, by Mr. Loening, as the first to see that a fighter plane must be lethal to be effective. The Spitfires, he said, are equipped with 8 machine guns, and even though they only carry enough ammunition to fire all guns continuously for 17 sec, a burst of 1-sec duration when the sights are on the target will just about cut a fuselage in half.

Stressing the necessity for better engine mufflers and quieter propellers for military planes, Mr. Loening explained that sound detectors will pick up an enemy flight 35 to 40 miles away. Balloon barrages have a certain nuisance value, he said, but will not keep planes from flying above the balloons. He cited the necessity of not-too-large airports well scattered and camouflaged. The Germans, he noted, have painted cows, barns, and trees on their landing fields, but, he added, these tricks do not fool color-blind pilots.

The importance of a thriving air-transport system as a background for national defense was emphasized by Mr. Loening, who contended that our commercial aviation will grow so rapidly after the war as to require all the expanded facilities now being turned to military needs. About 10,000 planes would be required to carry all first-class mail by air, and the possibilities of air cargo have hardly been touched, he declared.

Williams Sees America Ignoring Air Lessons

▪ *Chicago*

The rear-admiral theory of air-defense control must go. In its place must arise a totally new conception in Washington of the practical principles of air power as demonstrated by Germany and Italy. And most important, this vital change in the attitude of our army and navy chiefs towards air power must come quickly if the United States is to pursue a sound course in its air-force preparedness program.

This, in brief, was the dynamic message which Major Al Williams, Gulf Oil Corp., famed air-racing pilot delivered in vigorous style at the October Chicago Section meeting. Addressing about 300 members and guests, Major Williams charged that because of our deplorable failure to recognize, even today, the underlying principles which govern air power as a combat force, the United States at this moment is lamentably weak in number of airplanes and is tragically amiss in the lack of adequate control procedure for our present limited air-force strength.

Major Williams, introduced by John A. Herlihy, United Air Lines Transport Corp., decried our "blind folly" in ignoring lessons demonstrated years ago by our army and navy flyers. "No lessons learned," he said, "from the sinking of the first battleship in a test bombing flight by Billy Mitchell years ago. No realization of our mistake in withdrawing racing planes from the International Schneider Cup Races, that great proving ground for developing the fast type of fighting planes needed today. With our armchair theories, we are asleep to the vital need of the hour, that of elevating the air force to its rightful place as a separate fighting arm alongside the land and sea forces, a conception that the Axis Powers long ago demonstrated was the only sane procedure if air power is to be utilized to its maximum effectiveness."

Major Williams told of "the tragedy of that thin red line of fighting planes still holding England," a tragic tale, he said, because of the blind indifference to German air plans that had been known for months before the outbreak of war, but had been blithely ignored. Facts on German air-might expansion, he recalled from his trip to Europe in 1936 just before the Munich agreement, were all familiar to military officials of England, France and the United States. It was all too clear that Germany, denied access to sea power and writhing under Versailles Treaty restrictions, was embarking on a tremendous program for air supremacy. Restrictions of Versailles gave birth first, Major Williams said, to a huge-scale German motorless plane development that produced 250,000 air-minded youthful gliders as potential air pilots. Then, he said, came the groundwork for Germany's air machine with its gigantic research facilities, underground assembly plants and mass production methods.

England Laid Keels

Meanwhile, Major Williams commented, England's armchair rear admirals kept laying keels. Sly Germans, exchanging winks, he said, broadcast tales about flocks of keels being laid in German ports. Observers, he reported, noting the many unfinished keels, made inquiry and got this answer, "Sure, they're just keels. Every time we lay one of them, those Britishers break their necks to lay three of their own and proceed to build the ships. That's just what we want them to do."

Forty days before Munich, Major Williams, who was in Germany at that time, declared, the Germans were building 600 planes a month. France, in contrast, Major Williams said, was then building only 75 planes a month. Calling attention to a little known reason for France's shortage of planes, the speaker said that France during the Spanish Civil War had set the pattern, later followed by Washington, of selling French planes to a commercial corporation which then transferred title on the planes to the Spanish Loyalists.

When the inevitable war plunge came, related Major Williams, U. S. military attaches saw the tragic harvest reaped from the

blunders sown by France and England, but "not until Ambassador Bullitt rushed from Paris to Washington with the cry 'We've got to have planes' was the belated air preparedness program of this country started." Yet as the "on-order" production fever now rages, said Major Williams, not a whisper is heard of the need for a separate air force and the conception of its use as a striking power backed by research, pilot training, and mass production of combat planes.

Kelsey Credits Pilots' Skill for Air Victories

Detroit

The skill and daring of pilots are more responsible for air victories than slight differences in speed or performance of planes, declared Capt. B. S. Kelsey, U. S. Army Air Corps, at the first-of-the-year meeting of the Detroit Section, Sept. 30. Capt. Kelsey, who was an American observer with the British and French armies, is now stationed at Wright Field, Dayton, developing and testing new types of airplanes.

The British and Germans, he stated, could exchange flying equipment, type for type, unit for unit, and the outcome would be the same, so marked is the superiority of the British air man. This is so important, he added, that sheer mass doesn't mean anything.

He declared that Royal Air Force pilots feel on equal terms with enemy fighters if the odds are no greater than three-to-one.

Total defense in air warfare is impossible, Capt. Kelsey opined, adding that a country cannot, through any defensive means yet devised, block the bombing of an objective. The best a defender can do, he said, is to make the attack so costly that the enemy will abandon it.

From his observation of the defense measures taken in Britain, he reported that total war means necessarily the participation of all citizens in defense. Old men, sitting all night on hilltops and in pastures of England armed with shotguns, watching for parachute troops, and other old men dragging ponds and searching everywhere for scrap iron, are probably doing more for England than the soldiers waiting for an attempted German attack, he stated.

American Cities Vulnerable

Hitting close to home, Capt. Kelsey declared that less than 100 men could capture a major American city in a blitzkrieg. The attacking force, he explained, would first organize a small band of determined, ruthless men, seize a radio station to serve as a control post and, with the aid of shock troops landed by airplane, would proceed to take over the police and fire departments of the city, would command telephone switchboards, put the citizenry into a state of hysteria, and shortly control the city.

He asserted that a blitzkrieg is not, as it is called, lightning war. Rather it is a slow working out of forces which undermine authority and gain control to make actual conquest a simple matter.

The responsibility of engineers in protecting the nation, particularly industrial cities, from attack and making America less vulnerable, was emphasized by the speaker. Establishment of police radio facilities in armored rooms, was cited as a necessity to avoid rapid disruption of municipal control. Capt. Kelsey urged that large industrial cities should provide auxiliary water supplies, particularly for the center of the city and for vital plants. Engineers, he said, should make certain that the first floors of all major buildings are constructed so as to be bombproof. They should also keep in mind that factories should be suitable for easy blackouts. Hospital facilities in factories should be of sufficient size to serve as auxiliary emergency wards. In times of peace, he argued, space made available in large hospital rooms could be used for sunray treatments, squash courts, and for other recreational uses by employees.

"It is perfectly possible for a democracy to fight a war as efficiently as a totalitarian state," Capt. Kelsey declared, adding that England is now proving this point.

Coffee speaker at the dinner which preceded Capt. Kelsey's talk was Russell Barnes, foreign affairs correspondent for The Detroit News. He presented an analysis of the historic forces which culminated in the present warfare in Europe.

Approximately 280 members of the Detroit Section attended the dinner and nearly 500 were in the audience which heard Capt. Kelsey and Mr. Barnes.

SAE National
Fuels & Lubricants Meeting

Mayo Hotel

Tulsa, Okla. **Nov. 7 & 8**

Thursday, November 7

10:00 A.M. ***Ulric B. Bray, Chairman***

On the Road with Dodge Diesel
– L. T. Knocke, Chrysler Corp.

Fuel for Diesel Engines
– A. T. McDonald, Caterpillar Tractor Co.

2:00 P.M. ***G. C. Richardson, Chairman***

Operating and Maintenance Problems on Diesel Engines in Bus Service
– Warren A. Taussig, Burlington Transportation Co.

Modern Diesel Lubricants for the Modern Diesel
– Ulric B. Bray, Consulting Chemist

6:30 P.M. ***Dinner***
William F. Lowe, Chairman

The Second Coming of Aviation
– William B. Stout, Stout Engineering Laboratories, Inc.

Friday, November 8

10:00 A.M. ***Ralph R. Matthews, Chairman***

Rationalizing Lubricating Greases
– M. B. Chittick, The Pure Oil Co.

Maintenance Development in Light Aircraft
– R. W. Rummel, Rearwin Aircraft & Engines, Inc.

2:00 P.M. ***Frank A. Suess, Chairman***

SAE in National Defense
– John A. C. Warner, SAE General Manager

Crankcase Oils for Heavy Duty Service
– H. R. Wolf, General Motors Research

6:30 P. M. ***Dinner***
C. S. Hansen, Chairman

Resolved: That Higher Compression Tractor Engines Are To Be Preferred for Tractor Power Equipment

Affirmative
Kansas State College
vs.
Negative
University of Oklahoma

Trundle Gives Views on Basic Defense Problems

Philadelphia

"I doubt very much whether we will be able to have all the luxuries of peace and at the same time prepare fully for war," George T. Trundle, Jr., president of Trundle Engineering Co., Cleveland, told Philadelphia Section members, Sept. 18, in a discussion of the basic industrial problems of national defense. Mr. Trundle, who had considerable experience in production work during the last war and is actively engaged in the present huge defense program, made clear his belief that through united effort all the way down the line the United States can be made so strong that war will not be apt to come to our shores.

The question of facilities, that is, plant, equipment, and machinery, he said, is the foremost problem of all. Granting that the vast national defense program will require new plants and new machinery, he cautioned that not every national defense plant

must be enormous or new, nor must all equipment for this purpose be new. He warned that in the anxiety to develop defense facilities, we may build up an unnecessarily large supply of mammoth plants and pile up an unnecessarily large inventory of new equipment.

To avoid this, Mr. Trundle recommended a survey of existing equipment and its productive capacity as a basis for determining how much additional equipment may be required. "I believe," he said, "that we have a great deal more equipment standing ready for national defense right now than anybody, including manufacturers, seems to be aware of."

As his answer to the current problem of a shortage of trained men, Mr. Trundle suggested that we marshall our training facilities in exactly the same way that we marshall our machinery and equipment facilities. He recommended that men who can be spared for training be put to work immediately. While this may mean a shade less production now, it will make possible a great deal more production next month and next year, he stated. Two specific suggestions in this regard, were:

1. Jobs in many a plant can be re-shuffled in such a way that the men who are more experienced can be freed for training.

2. Older men, skilled mechanics, who during the depression years drifted out of industry into other occupations, should be located and brought back into industry. They should be put to work training the younger men.

Coming to the problem of the public frame of mind toward the whole problem of national defense, Mr. Trundle observed that most people today are thinking about what the government ought to do, or what industry ought to do. They have not, he said, realized that the most important factor in the whole situation is what they themselves not only ought to do, but will have to do. In Mr. Trundle's opinion, if this country is really going to prepare itself on a basis of total defense comparable to the attacking power of European countries, every person in the United States capable of doing a day's work is going to have to go to work directly or indirectly on national defense.

Mr. Trundle made a plea for united thinking, united effort, cooperation, elimination of interference, and concentration upon the job to be done.

The discussion that followed Mr. Trundle's presentation was "off the record."

Suggests Ways Canada Can Solve After-War Problems

■ *Canadian*

Three primary problems that will confront Canada "after victory has restored peace to the Dominion, the Empire, and the world," were brought up for discussion at the Canadian Section's Sept. 20 meeting by Russell T. Kelley, an automotive-minded advertising executive, a Section member, and a past president of the Canadian Good Roads Association and of the Ontario Motor League. Not originally scheduled to speak, Mr. Kelley consented at the last moment when Lynn B. Spencer, K.C., programmed speaker, wired that he was detained by war work at Canada's capital, Ottawa.

Youth training and employment, the railroad problem relative to the national debt and the modernization and coordination of transportation, and over-government relative to economic and efficient administration, are the primary problems that Canadians will have to solve, Mr. Kelley said.

He stated that Canada has less than a quarter of the population of Great Britain and expends millions more in government annually than does the Mother Country. The multiplicity of politicians in Canada, he noted, derives from the political organization established when the horse provided the fastest means of transportation and communication – the origin of the political sub-division term "riding." He made it clear that, in his opinion, failure to streamline Canada's political organization is attributable to inertia, the retentive interest of the politician and the apathy of the public.

Mr. Kelley deprecated the over-production thesis and contended that factually it is untenable in the face of a multiplicity of unsatisfied wants and desires. Acceptance of the under-consumption thesis and adjustment of the national economy to it would in large part, he contended, solve the unemployment problem which, he said, will inevitably recur after the war, provided that preventive measures are not taken in the interim. Such measures with the economies he advocated, Mr. Kelley asserted, would go far towards solving the national debt problem, because they would greatly increase the source of real wealth – production and exchange of goods and services.

He declared, also, that healthy national economy cannot exist without a prosperous agriculture and that experience in fixation

Dayton Section Elects

Robert V. Kerley, Materiel Division, U. S. Army Air Corps, whose election as 1940-1941 chairman of the SAE Dayton Section recently was announced.

Other new Dayton officers are: W. J. Blanchard, Aeroproducts Division, General Motors Corp., vice chairman; Earl S. Patch, Moraine Products Division, General Motors Corp., treasurer; and Ernest J. Stockum, G.H.R. Foundry Co., secretary

of milk prices on a profitable basis for the farmer, had proven so satisfactory as to warrant the extension of such control to other farm products.

In the course of the discussion which followed Mr. Kelley's presentation, Mel S. Brooks, president of Studebaker of Canada, supported the views of the speaker and described the success that had attended the price-fixation experiment in Australia, where he had spent a number of years.

A Canadian Section golf tournament preceded the dinner meeting, which was held at the Hamilton Golf & Country Club, Ancaster, Ont. Section Chairman Norman H. Daniel presided. Host for the occasion was the Steel Co. of Canada, Ltd.

Flight Engineer Kept Busy on Ocean Plane

▪ No. California

The flight engineer's responsibilities have increased so that he now rates a desk and a swivel chair in a compartment all his own aboard the new Boeing transpacific planes, Chief Flight Engineer C. M. Green of Pan American Airways told Northern California Section members and guests on Sept. 10. He shared the two-paper program with Donald Wood, National Advisory Committee for Aeronautics, who traced 20 years of research by the NACA and reported on its new aeronautical laboratory now being built at Moffett Field, Sunnyvale, Calif.

While the flight engineer is mainly responsible for the operation of the engines, reporting 90 readings per hr on the log sheet, he checks all mechanical items aboard ship and, in addition, prepares the "how-goes-it" chart, explained Mr. Green. This chart, he said, indicates the amount of fuel consumed for miles covered and is important in long-distance flying, since it governs decisions as to the proper air speed and altitude for the remainder of the flight. The importance of operating at the best combination of air speed and altitude, he added, is reflected by the fact that a 1% reduction in fuel means room for one more paying passenger, and cutting 10 min off a flight means an equivalent weight saving. Weather forecasts, he continued, are available every few hours and fuel consumption data under all possible conditions of load, speed, and altitude, are obtained from extensive flight testing of each new ship prior to its start in scheduled service.

Other duties of the flight engineer, outlined by Mr. Green, include an inspection of the engine every few hours via passages in the wings, operation of wing flaps during landings and take-offs, and directing and checking of all repairs and services made both at the home base and on overnight stops. Mr. Green predicted a time when airplanes will be fully equipped with shops and men to care for all regular repair and service work, with the plane returning to its home base only once in four or five round-world trips.

Navigation Accurate

Under normal conditions, navigation is so accurate that the number of miles traveled can be determined to plus or minus five miles. This fact was brought out in discussion by Mr Green's answer to a question by R. C. Olsen of Chevrolet.

"What means are available for correcting a bad situation of the 'how-goes-it' chart?" asked William V. Hanley, Standard Oil Co. of Calif., technical chairman of the meeting. He was told that to decrease power and air speed and to change to an altitude with a favorable tail wind were the most promising steps. If the fuel consumption is too much greater than predicted, said Mr. Green, faulty engine setting or gasoline leakage is indicated.

The new NACA laboratory at Sunnyvale,

said Mr. Wood in his paper, will be fitted to carry out the objectives of the Committee—"to study the fundamental problems of aeronautics." It will be divided, he added, into groups on engine research, instrument research, and aerodynamic and flight research.

Selection of the West Coast for the new laboratory by the NACA is due to both lack of space for expansion at its Langley Field, Va., laboratory, and to the fact that some 90% of aircraft production is centered on the Pacific Coast, Mr. Wood explained.

The most powerful wind tunnel in the world, capable of 500-mph air speeds, is under construction at Sunnyvale, Mr. Wood stated. It is a 27,000-hp affair with a 16-ft diameter throat and a 45-ft diameter return loop. Two other wind tunnels are also being built, he said.

At the present time, Mr. Wood explained, the NACA is composed of 16 men who serve without pay and direct the activities of 700 research workers and engineers. It maintains a publication office, operates a patent and invention department and, in general, acts as a clearing house for all research and development work concerned with aeronautics.

Before concluding his talk, Mr. Wood had shown a new motion picture, which is being released by the NACA to technical groups. It is titled "The Slow-Motion Study of Normal Combustion, Pre-Ignition, and Knock in a Spark-Ignition Engine."

Pittsburgh Extends Activities

As a part of a program to expand activities of the Pittsburgh Section in the Oil City-Franklin territory, officers and members of the Section's governing board were entertained at luncheon by members residing in that district. P. M. Robinson, research and development engineer, Pennzoil Co., was elected Section vice chairman representing the Oil City-Franklin territory. Plans were announced for an annual meeting sponsored by members in the area, to be held in cooperation with the Section. About 20 were present at the luncheon.

President Nutt Visits Western SAE Sections

Leaving the East shortly after the Society's Annual Dinner, SAE President Arthur Nutt started on a trip to visit the SAE Pacific Coast Sections. En route he stopped at Denver, Oct. 16, and addressed the SAE Club of Colorado.

Arriving in Seattle, Oct. 21, Mr. Nutt was joined by SAE General Manager John A. C. Warner, and both men spoke at the Northwest Section meeting that night. They were guests of honor and speakers at the Oregon Section meeting in Portland, Oct. 22, and at the Northern California Section meeting in Oakland, Oct. 24.

Mr. Nutt's paper, "Lessons Learned from the European Aircraft Industry," was reported in the October SAE Journal (page 13). The SAE in National Defense, was Mr. Warner's topic.

Messrs. Nutt and Warner are scheduled to be in Los Angeles for the SAE National Aircraft Production Meeting, Oct. 31, Nov. 1-2, where Mr. Nutt is to speak on "The Standardization Problem in the Aircraft Industry."

Gay Gives Gasoline Man's Views on Fleet Problems

■ *Baltimore*

"The best specification an operator can have for gasoline is to buy from a reputable marketer or refiner. Today the competitive necessity for producing a good gasoline writes a more rigid specification than almost any set of specifications which any of you as an individual might be able to compile."

That was Errol J. Gay's reply to the fleet owner's question: "How should I buy gasoline?" in his talk before Baltimore Section members on Sept. 17. He was introduced by Section Chairman R. J. Grow. Mr. Gay, who is truck and bus engineer, Ethyl Gasoline Corp., titled his paper "A Gasoline Man Looks at Fleet Management." In it he answered the questions most often asked by operators contacted by representatives of his company.

"What about the increase in antiknock value of present-day gasolines? What can we do to take advantage of them?" These questions were next on Mr. Gay's list. He pointed out that engines of much old equipment have compression ratios too low to take full advantage of modern fuels. However, he said, many of these engines might respond favorably to increased compression ratios. He suggested that because of expense any changeover to different pistons or heads should be made gradually, and preferably at the time of engine overhaul. Consult your engine supplier first, he advised, because sometimes it is best not to raise the ratio.

Much of the present new equipment is

Winner of T&M Salmon Derby

Russell A. Watson, chairman of the Northern California Section, won the Salmon Derby held in connection with the West Coast Transportation & Maintenance Meeting at Seattle last August. The beauty he is holding was the biggest catch.

capable of taking advantage of today's fuels by proper spark timing, Mr. Gay said. He advised fleet men to give thought to possible changes in fuel octane number in buying future equipment, and to ask the manufacturer if his design of engine will safely permit increased ratios. Some prophesy that by 1945 we will have 80 octane regular grade fuel, he reported.

Commenting on vapor lock Mr. Gay said: "Fuel lines should be shielded from hot surfaces and the old rule that the shortest distance between two points is a straight line does not apply in this particular instance, as it is much more desirable to use a longer pipe and to avoid hot surfaces."

He pointed out that it is well to investigate fuel-line temperatures even though there is no vapor lock, since gasoline reaching the carburetor at 150 to 170 F is bound to have a certain percentage of its volume converted into vapor. This is lost entirely, either through the balancing tube of the carburetor or to the outside air if the carburetor is vented, he explained.

Mr. Gay stressed the importance of carburetor maintenance by calling attention that on a large truck "the carburetor spends as much as you pay the driver in wages." For a truck or city bus, he said, a carburetor should be overhauled every 25,000 miles, and for an inter-city bus, between 35,000 and 50,000 miles. "All jets that have anything to do with metering the fuel should be replaced between 75,000 and 100,000 miles," he added.

More costly but better engine oils were predicted by Mr. Gay. Oils are being developed, he said, that seem to have great possibilities, particularly in the heavy-duty field – but they can't be sold for the same price of some of the oils they replace.

Winding up, Mr. Gay placed great emphasis on training drivers so that they will get good gasoline mileage and put the least mechanical strain on the vehicles. Drive with them, find out driving practices that need to be corrected, and then launch a well-thought-out intelligent educational program, he advised.

Weight Reduction Seen as Probable Economy Trend

▪ *Metropolitan*

Lighter automobiles, in the interest of low first cost and operating economy, were predicted by W. D. Appel, General Motors Corp., when the Metropolitan Section met, Oct. 3, to look into the future of passenger-car design.

Assuming that taxes will be increased and net incomes will be generally lower because of huge preparedness outlays, Mr. Appel told how European makers had met a similar situation by offering smaller and more economical cars to the motorists overseas.

"I do not believe the American public is going to be satisfied with either a smaller complete car, or a large trimmed-down car," he said. "Our problem is to keep cars almost the same size, as far as body space is concerned, but to reduce the first cost and upkeep cost by mixing a little more brains with the iron."

Weight saving, he said, is self-generating because it begets weight saving. "If a car is lighter, the engine can be made smaller, which permits smaller and lighter brakes," he commented.

"The only practical approach I know of,

is to build a car as light as possible and then find out by successive tests how much each part must be increased to just enable the vehicle to safely carry the load," he continued, adding, "this is a far longer process than annual redesign."

T. C. Smith, American Telephone & Telegraph Co., in commenting on Mr. Appel's paper, suggested that "more brains should be mixed with aluminum, magnesium, and other alloys developed by the aircraft industry instead of iron."

Norman G. Shidle, executive editor, SAE JOURNAL, pointed out that it will probably be a long time before Americans are faced with European peacetime taxes, despite present national defense outlays.

"Frankly," Mr. Shidle declared, "I believe that automobile design must – and should – continue to give the public what it wants. And in estimating what the chances are for a radical change in public demand, I think engineers must give more consideration to the *magnitude* of the economic forces pushing toward 'economy' vehicles – not merely to the *direction* of these forces. For a long while now," he added, "the direction of these economic forces has been toward the creation of a more fertile field for a vehicle which emphasizes economy as well as comfort and performance." However, he said, as long as the price of gasoline remains under, say, 25c. per gal, Americans probably won't demand "economy regardless of comfort in their automobiles."

Austin M. Wolf, automotive consultant, suggested that a properly designed fluid flywheel would save gasoline as well as permit considerable saving of weight in the design of the vehicle.

"The field of plastics offers interesting weight-saving possibilities," he said, predicting that we are on the threshold of considerable use of these materials. He expects that a lightweight or "tin can" engine will make its appearance in the not-far-distant future, offering new possibilities for weight saving in both the powerplant and in the chassis of motor cars.

Almon L. Beall, Wright Aeronautical Corp., and E. S. Hall, Round Engine Patents, suggested more study by automobile manufacturers of the airplane type of structural design. Both suggested that rear-engine design would permit considerably lighter chassis construction, and mentioned tubular chassis members as a sound prospect.

Herbert Chase, consultant, pointed out that independent wheel suspension requires heavier frames and other structural parts. He doubted the public's sincerity in its desire for economy, as has been indicated by the General Motors' and other surveys. "The fact is," he declared, "no matter what they say, most drivers do not drive at 25 mph, but hit averages closer to 50 mph."

New Points Covered in Discussion of Oil Paper

■ No. California

By popular demand, "Lubricating Oil for Internal Combustion Engines," by L. H. Mulit and F. W. Kavanagh, originally presented at the SAE West Coast Transportation Meeting, in Seattle, Aug. 16-17, was repeated at the Northern California Section meeting, Oct. 8. The problem of evaluating and selecting internal-combustion-engine oils to assure satisfactory performance and minimize failures was considered by these Standard Oil of Calif. research engineers whose paper was reported in the September SAE JOURNAL *(page 12)*.

New opinions and information were added by Northern California members to the discussion stimulated at the Seattle meeting.

The purpose of an additive in a lubricating oil, it was brought out, is to hold in suspension any gums that may form, so that they can settle to the crankcase or be filtered out, rather than settle on piston and liner. Thus, the additives are definitely used up. In this connection, it was stated that a dirty oil may indicate a clean engine if the correct additives have been used, while an oil that appears clean after considerable use may be failing in one of its duties – that of removing or preventing the formation of gum and lacquer.

Filters came up for discussion with comments that either the metal-edge or cloth type can be used with lubricating oils containing additives, while filters containing fuller's earth will remove the additives and therefore should not be used.

Since a filter becomes clogged slowly at first, then more rapidly the longer a given batch of oil is used, it was suggested, for general car or truck operation, that the same oil be used until the filter element becomes clogged, and that the oil should then be drained, new oil put in and the filter element replaced. Considering the relative cost of oil and filter elements, it was pointed out, this suggestion may well be adopted by fleet operators.

Student Branch Elects

Stanley W. Siggs, who last year was secretary of the SAE Student Branch at the University of Detroit, has been elected chairman for 1940-1941. The vice chairman for the forthcoming season is Oscar Noren, and the secretary-treasurer, Donald C. Hunt. Both Mr. Siggs and Mr. Hunt are senior aeronautical engineering students. Mr. Noren is a junior in mechanical engineering.

THEY JUST KEEP *Rolling* ALONG

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HYATT QUIET ROLLER BEARINGS

SAE Coming Events

Nov. 7–8 — National Fuels & Lubricants Meeting
Mayo Hotel – Tulsa, Okla.

Jan. 6–10, 1941 — Annual Meeting
(and Engineering Display)
Book-Cadillac Hotel – Detroit

Canadian – Nov. 19

Royal York Hotel, Toronto. Lessons Learned from the European Aircraft Industry – Arthur Nutt, vice president of engineering, Wright Aeronautical Corp., and president of the SAE. SAE in National Defense – John A. C. Warner, secretary and general manager of the SAE.

Cleveland – Nov. 11

Cleveland Club, Cleveland. Mechanical Features of the 1941 Passenger Cars – Joseph Geschelin, Detroit technical editor, Chilton Publications.

Detroit – Nov. 11

Hotel Statler, Detroit; 8:00 p.m. The Economics of Substituting Synthetic Rubber in Automobiles – W. J. McCortney, engineer in charge of the Rubber Plastics Laboratory, Chrysler Corp.

Indiana – Nov. 14

Antlers Hotel, Indianapolis; dinner 6:45 p.m. Mechanical Features of the 1941 Passenger Cars – Joseph Geschelin, Detroit technical editor, Chilton Publications.

Metropolitan – Nov. 14

Hotel New Yorker, New York City; dinner 6:30 p.m. T. & M.-Aeronautic joint meeting. Airline Equipment Maintenance – J. F. Martin, superintendent of maintenance, and R. A. Miller, supervisor of overhaul, American Airlines, Inc.

Northern California – Nov. 12

Subject: Fuels and Lubricants.

Oregon – Nov. 22

Lloyds Golf Club, Portland; dinner 6:30 p.m. The Fuel Factor in Future Engine Design – W. H. Hubner, Refinery Technology Division, Ethyl Gasoline Corp.

Philadelphia – Nov. 13

Penn Athletic Club, Philadelphia; dinner 6:30 p.m. Diesel Symposium – Francis Masi, research engineer, Superior Engine Division, National Supply Co.

Pittsburgh – Nov. 26

Webster Hall, dinner 6:30 p.m. Meeting at Mellon Institute. Steel Spring Development and Weight Distribution – N. E. Hendrickson, vice president and chief engineer, Mather Spring Co.

Southern California – Nov. 12

Hotel Biltmore, Los Angeles. Subject: Transportation and Maintenance. Technical Chairman: Rex Taylor.

Southern New England – Nov. 6

Hotel Bond, Hartford, Conn.; dinner 6:30 p.m. Bearings and Bearing Lubrication – Frank O. Hoagland, master mechanic, Pratt & Whitney Division, Niles-Bement-Pond Co.

Syracuse – Nov. 25

Onondaga Hotel, Syracuse; dinner 6:30 p.m. Mechanical Features of the 1941 Passenger Cars – Joseph Geschelin, Detroit technical editor, Chilton Publications.

Washington – Nov. 12

Dodge Hotel, Washington, D. C.; dinner 6:30 p.m. Superfinish – David A. Wallace, president, Chrysler Sales Division, Chrysler Corp.

Rubber-Hardness Testing Problem Cited by Brown

▪ Washington

"There are as many as 300 rubber parts in a car chassis" was one of the many interesting statements by Roy W. Brown, research engineer, Firestone Tire & Rubber Co., at the Washington Section meeting, Oct. 8, in a highlight review of his Summer Meeting paper, "Engineering Properties of Rubber in Compression." He emphasized particularly the need for systematized data on the physical properties of rubber and made a plea for standardized terminology.

The most important characteristics of rubber compounds are their load deformation properties, Mr. Brown said. Since these are not linear and are different for different compounds, they can best be expressed graphically, he asserted, illustrating his point with load-deformation curves for compounds of varying hardness. He said that the physical properties of high-grade stocks having small hysteresis, and low permanent set can be evaluated on a basis of hardness, much in the same manner as the strength of ferrous metals can be predicted from hardness tests. Methods of measuring hardness are not entirely satisfactory at present, he added, but the SAE is cooperating with the ASTM to bring about improvement.

The effect of temperature on load-deformation characteristics, Mr. Brown said, can be calculated with the aid of multipliers obtained from graphs. Similarly, he stated, the effect of different types of mountings can be calculated. The speaker cautioned that failure to make allowance for creep had led to grief in many applications.

Mr. Brown said that the problem of systematizing data is made difficult by the fact that there are over 3000 different rubber compounds on the market. If necessary this number could be reduced to 25 or less, he opinioned.

Mr. Brown's paper, "Engineering Properties of Rubber in Compression," was published in the 1940 October SAE Journal, Transactions Section, pp. 432-444.

Chrysler Fluid Drive Described by Barnes

▪ Oregon

Members of the Oregon Section heard James P. Barnes, service manager for Roy Burnett Motors, Inc., clearly describe the 1940 Chrysler-type fluid drive when they met Sept. 13.

Aided by a disassembled actual-size unit and a glass-enclosed manually-operated model, Mr. Barnes explained and demonstrated the action of the three essential parts – the flywheel or driver, the runner or driven unit, and the cover.

The fluid drive, Mr. Barnes pointed out, is not affected by heat or cold. He explained that the fluid might congeal at temperatures below —40 F, but that no difficulty would be experienced in operation because the fluid would again become active as the heat of the motor affected it.

In commenting on cold weather operation, Mr. Barnes said that automobiles equipped with fluid drive are able to pull out of tight spots on icy or muddy roads because this type of drive offers more perfect starting and preservation of traction than conventional gears.

The second feature of the meeting was the showing of "The Mysterious Case of the Mumbling Maniac," a moving picture short prepared by the American Petroleum Institute and presented by the Standard Oil Co. of Calif.

New Members Qualified

(*Concluded from page 31*)

SKOGLUND, VICTOR J. (J) project engineer, Pratt & Whitney Aircraft, Division of United Aircraft Corp., East Hartford, Conn.

Washington Section

ENGELMANN, GEORGE E. (A) special representative, Studebaker Corp., South Bend, Ind. (mail) 1308 Sheridan St., N. W., Washington.

FELDMAN, HYMAN (J) junior automotive engineer, Capital Transit Co., Mechanical Department, 3222 M St., Washington.

Outside of Section Territory

CUTLER, RAYMOND R. (M) automotive engineer, Socony-Vacuum Oil Co., Burlington, Vt. (mail) 27 East St., Essex Junction, Vt.

HENDREN, JOSEPH T. (M) chief chemist, Pan American Airways, Miami, Fla. (mail) 7711 N. W. 13th Court.

LURA, LOREN E. (J) engineer, Minneapolis Moline Power Implement Co., Minneapolis. (mail) 3106 28th Ave., South.